VOLUME XLI NUMBER FOUR

THE NATIONAL GEOGRAPHIC MAGAZINE

APRIL, 1922

CONTENTS

SIXTEEN PAGES IN FULL COLOR

Viscount Bryce's Last Article on the United States—The Scenery of North America
With 45 Illustrations, Including 16 Special Engravings

Modern Scenes in Mesopotamia, the Cradle of Civilization
With 16 Illustrations in Full Color by Eric Keast Burke

South Georgia, An Outpost of the Antarctic
With 43 Illustrations ROBERT CUSHMAN MURPHY

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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

TO carry out the purposes for which it was founded thirty-four years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resultant given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization which was waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the historic expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members through The Society to the Federal Government when the congressional appropriation for the purchase was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people and incorporated into a National Park.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings whose ruins are ranked second to none of ancient times in point of architecture, and whose customs, ceremonies and name have been engulfed in an oblivion more complete than any other people who left traces comparable to theirs.

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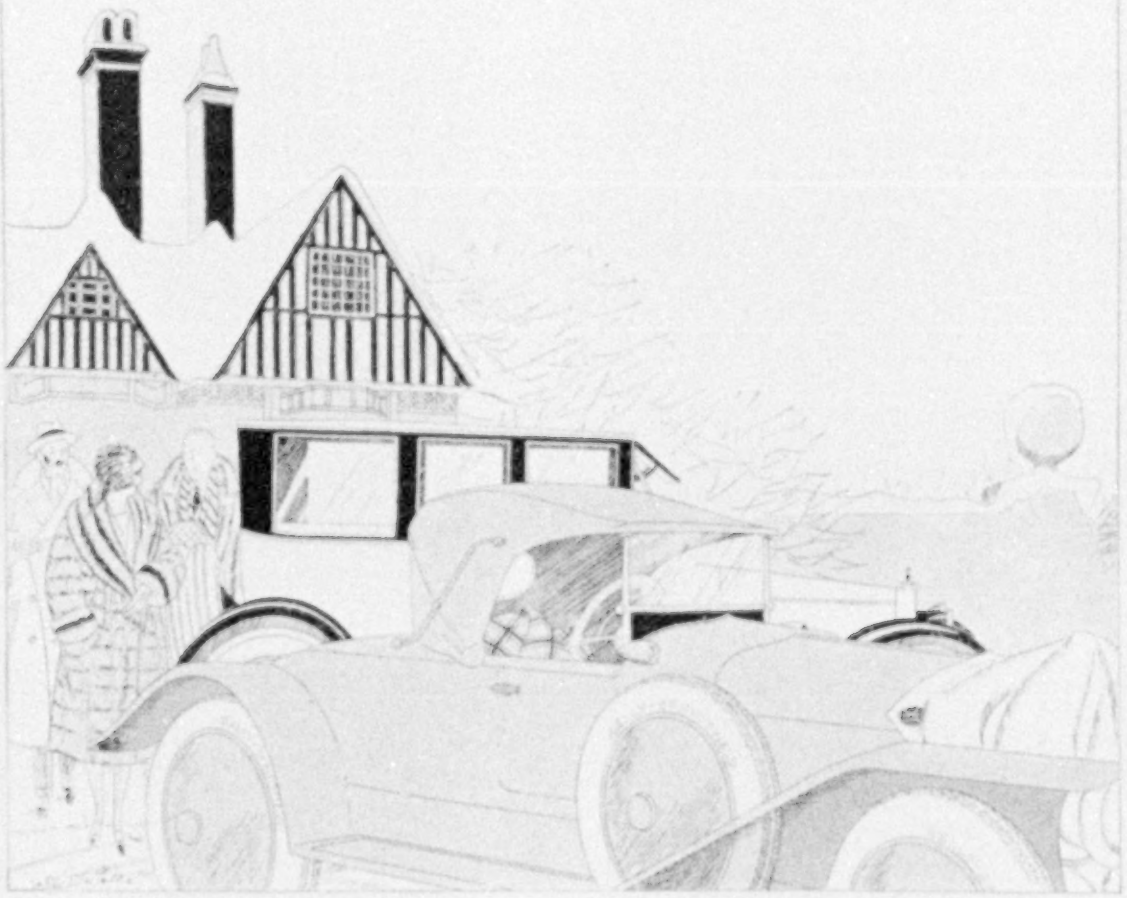

"Yes, Jerry, I know your car is more comfortable, but on these slippery roads I'd rather ride on Dick's Kelly-Springfield Cords."

KELLY KANT-SLIP CORDS are not only a remarkable achievement in non-skid tires, but in addition to their ability to hold the road they deliver the long, uninterrupted mileage for which Kelly Tires have always been noted. Also, Kellys now cost no more than many other tires that have never had the Kelly reputation.

"DEPENDABILITY PLUS"

In an unpretentious office in one of the greatest manufacturing plants in the world, there sits a quiet, elderly man who is known to every one, from the president to the smallest office boy, as "Dependability Plus."

For forty years he has been in the employ of this company. There is not a question concerning the business that he cannot answer better than any one else. He is responsible for more than half the improvements in their product; he tests and approves every change in their methods. His achievements have won him world-wide fame.

Yet, if you ask him, he will tell you that his greatest pride is in the affectionate, respectful name by which he is known to all, "Dependability Plus."

For every man who is voluntarily dependable, there are a hundred dependable only through force of circumstance. Placed in positions where dependability is a requirement, it becomes with them a forced virtue—a feeble flame that needs the constant fanning of necessity.

Voluntary dependability is a quality of the spirit. It may characterize a business as well as a man or woman. When it does you will find the name of that business honored and respected wherever it is heard. And you will find its products of a quality that is rarely equaled.

In the manufacture of pharmaceutical and chemical products Squibb holds such a place. Squibb quality in the products described below is a revelation to persons who use them for the first time.

Squibb's castor oil, for example, is not the offensive, unpleasant cathartic that is taken under protest by so many people. By careful refining and purifying, the Squibb product is almost entirely freed from the detested taste and is of *greater medicinal value* as well.

This same thing holds true with other Squibb HOUSEHOLD PRODUCTS. At the Squibb Laboratories, for more than half a century, a constant process of testing and research work has raised the purity and efficacy of all Squibb products to a point that never has been reached before.

There is no reason why you should be satisfied with quality that is inferior to Squibb. But there are a score of reasons why you should prefer Squibb quality above any other.

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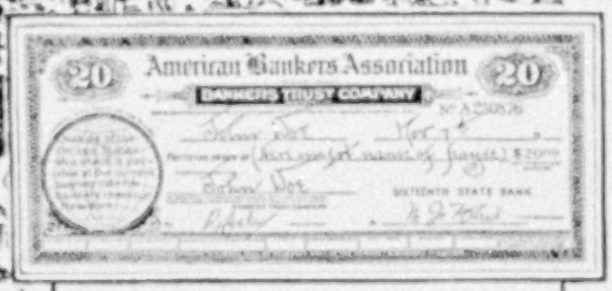
---because those who carry them are not dependent on banks and banking hours; they are accepted at all times and in all places ---



TRAVELERS'

A·B·A American Bankers Association Cheques

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or
write for particulars to

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TRUST
COMPANY
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FACTS

About A·B·A Cheques

—universally used by travelers and accepted as money in every land.

—your countersignature in presence of acceptor identifies you.

—safe to have on the person because they cannot be used until they have been countersigned by the original holder.

—safer than money, and frequently more convenient than Letters of Credit because the bearer is less dependent on banking hours.

—issued by banks everywhere in denominations of $10, $20, $50 and $100.

—compact, easy to carry, handy to use.

Above, Plato and his disciples on the steps of the Greek Academy, which he founded about 300 B. C. and which lasted 900 years. • • • Below, one of the new Corsican series of Elgin Watches: material, construction, adjustments and service fully covered by Elgin Guarantee.

The Value of Time

In the Elgin historical art-cycle recently completed, we have seen how the world's timekeeping devices kept pace with its awakening to the Value of Time. In this second chapter of the new series, "Kronos" views Father Time through the eyes of the greatest philosopher of his age.

By Krónos

Paintings by
HAROLD DELAY

"TIME," cried Plato to the men of Athens, "is the gift of the gods—the movable image of Eternity!"

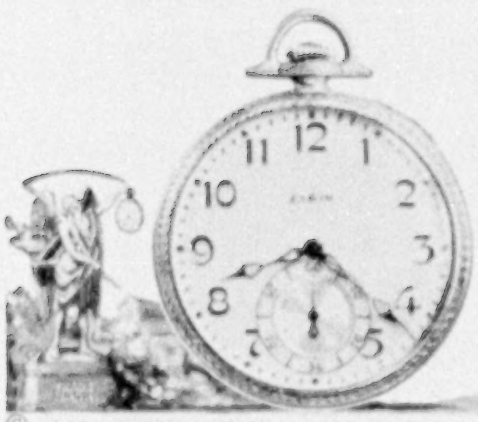
Plato saw Time as the great companion, guiding human life through the fleeting years to its home on "the luminous slopes of the stars."

"The Creator" he said, "brought into being the sun, earth, moon and the five other stars we call planets, to distinguish and safeguard the apportionment of Time. To this universe He allotted souls equal in number to all the stars in the heavens—that each soul, after living out his appointed Time, might return to his own star."

From this Year of our Lord 1922, with its watchwords of "Efficiency" and "Power of Will" as guideposts to success, the historians trace back to Plato the first definite expression of the Will-Plan of life.

He who would lay hold on his life, dominating instead of drifting, must lay hold on his Time—by resolutely safeguarding the golden hours of *Now*:

"*Time was* is past: thou canst it not recall,
Time is thou hast: employ thy portion small.
Time future is not, and may never be—
Time present is the only Time for thee!"



Over the Time of the ancients, the sun and moon kept watch. But the Twentieth Century, more richly endowed, intrusts life's costliest possession to those marvels of accuracy which bring to us the accumulated experience of all the ages—

Elgin Watches

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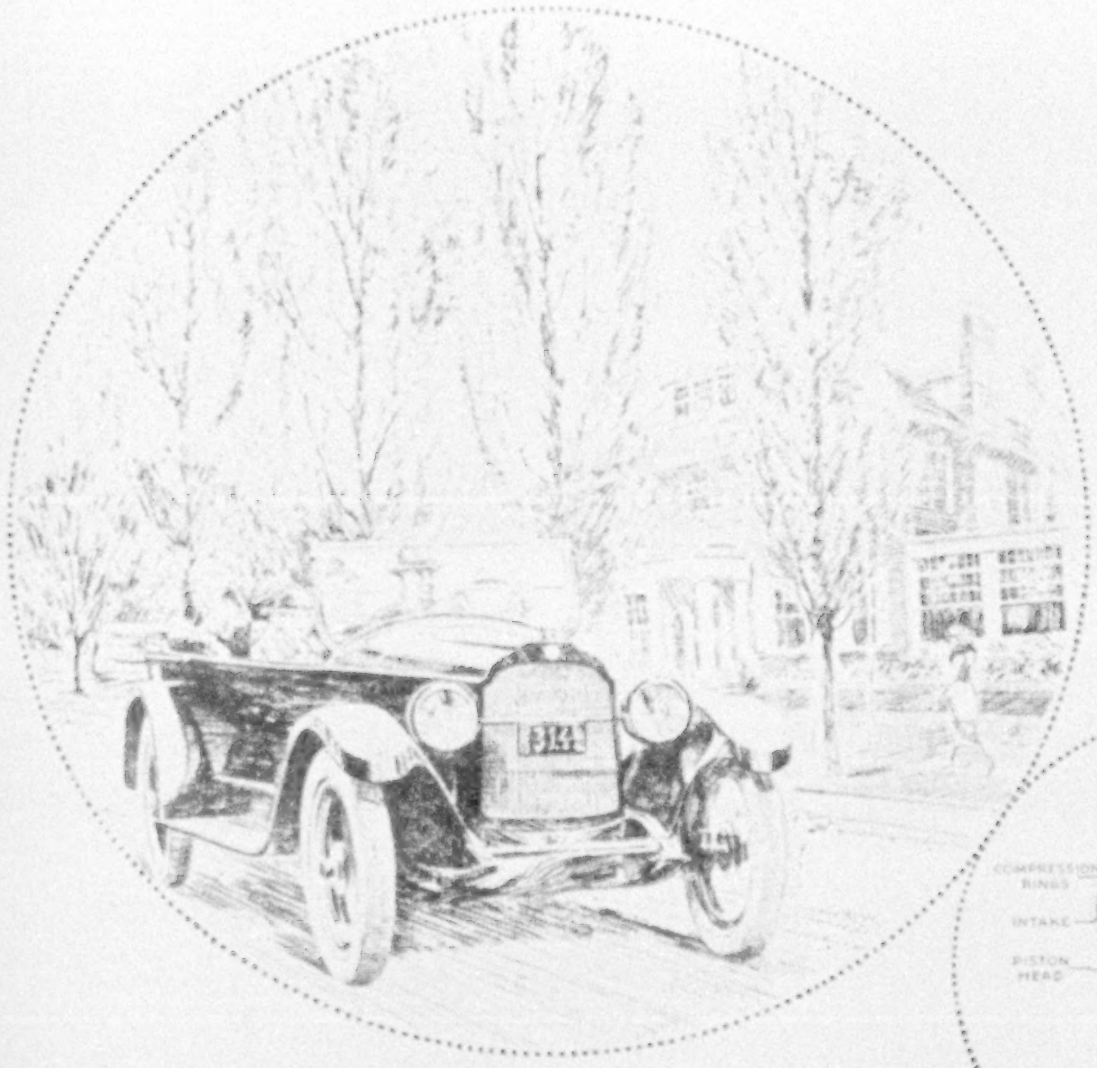

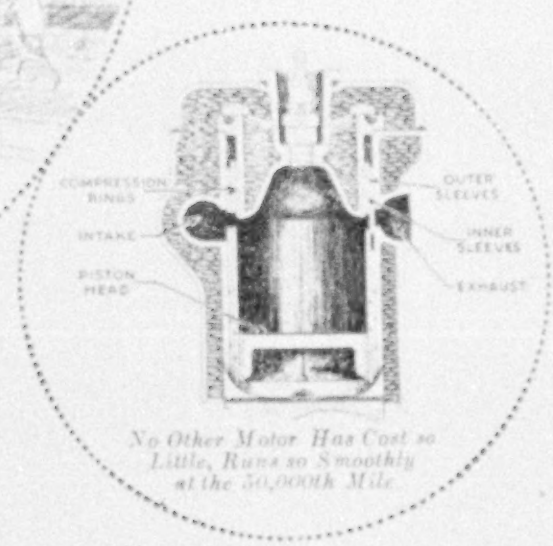

No Other Motor Has Cost so Little, Runs so Smoothly at the 50,000th Mile

TREMENDOUS MILEAGE

Records of 100,000 and 200,000 miles almost wholly free from repair give vivid emphasis to this owner verdict: That the Willys-Knight provides luxurious riding comfort with economy of service year after year.

It is the Willys-Knight Sleeve-Valve Motor which provides this tremendous mileage. Study the design. No tappets; no valve-heads to check the in-rush and exhaust of gas; no clicking springs to weaken; no cams to hammer and wear out.

But instead: Wide free ports for the gas in metal sleeves which slide noiselessly on a film of oil. A big, round combustion chamber with center-fire spark where every drop of gas is turned into power for your use. The little carbon that forms helps to seal compression more tightly.

The stalwart chassis matches the age-resisting motor. The coachwork completes the car's perfections. Thus luxurious travel becomes a continuous economy with the Willys-Knight.

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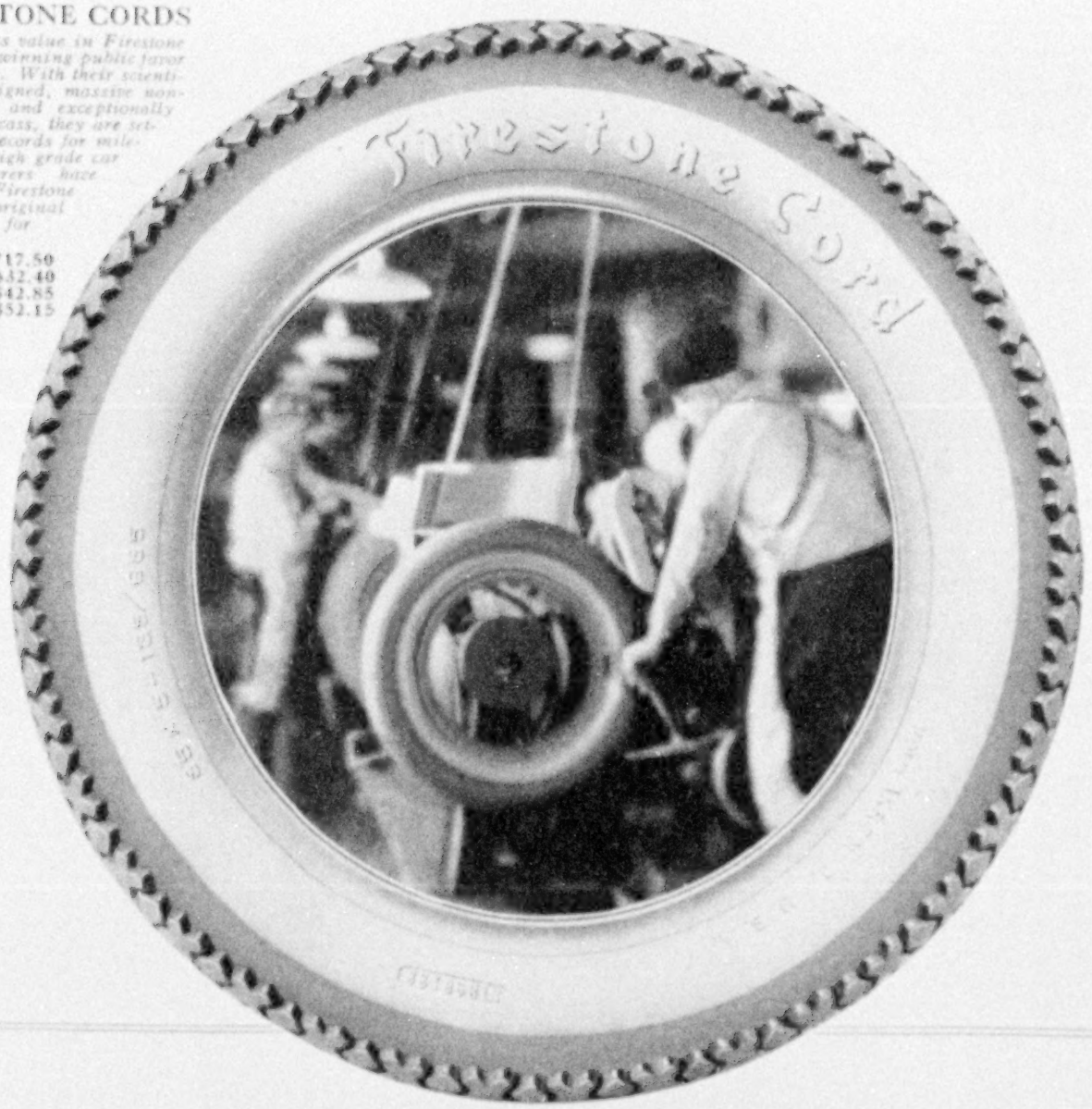
WILLYS-KNIGHT

Sleeve Valve Motor Improves With Use

FIRESTONE CORDS

The plus value in Firestone Cords are winning public favor everywhere. With their scientifically designed, massive non-skid tread and exceptionally sturdy carcass, they are setting new records for mileage. 62 high grade car manufacturers have adopted Firestone Cords as original equipment for 1922.

30 x 3½, $17.50
32 x 4, $32.40
33 x 4½, $42.85
33 x 5, $52.15



Multiplied Economies

THE tire values now obtainable from Firestone dealers are outstanding examples of today's low cost of dependable mileage.

Minute economies—so small as to seem negligible to the layman's eye—become great in the aggregate. In the Firestone plants, scientific organization and equipment have reduced waste to the minimum and effected every possible saving.

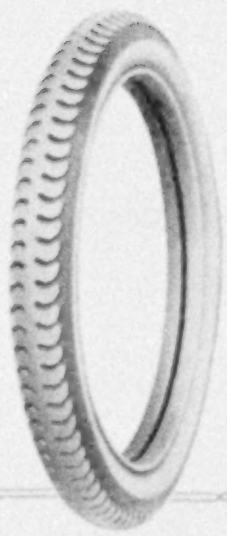
It is a matter of organization pride that Firestone Tires shall deliver their great mileage at the lowest cost per mile. The multiplied economies of large-scale production have made it possible at this time to give car-owners tires of finest quality at prices never equalled in the past.

$11.65

30 x 3½ extra size non-skid, scientifically balanced and designed. Made of best materials obtainable. Built in Plant No. 2, devoted exclusively to 30 x 3½ inch tires with a capacity of 16,000 a day. In 30 x 3 size at $9.85.

Most Miles per Dollar

Firestone



$9.99

Oldfield "999", a 30 x 3½ non-skid full size tire. Built with 4 ply long staple fabric. In 30 x 3 size at $8.99. At these prices this tire gives a remarkably high value in quality and dependable service. Sold by Firestone dealers.

How Ten Minutes Fun Every Day Keeps Me Fit

By Walter Camp

Famous Yale Coach's "Daily Dozen" Exercises Now on Phonograph Records

"ONE night during the war I was sitting in the smoking compartment of a Pullman sleeping-car when a man came in and said, "Mr. Camp?"

I told him I was, and he continued, "Well, there is a man in the car here who is in very bad shape, and we wondered if you could not do something for him."

"What is the matter?" I asked.

"This fellow is running up and down the aisle in his pajamas," the man said, "trying to get them to stop the train to let him get some dope, because he hasn't slept for four nights."

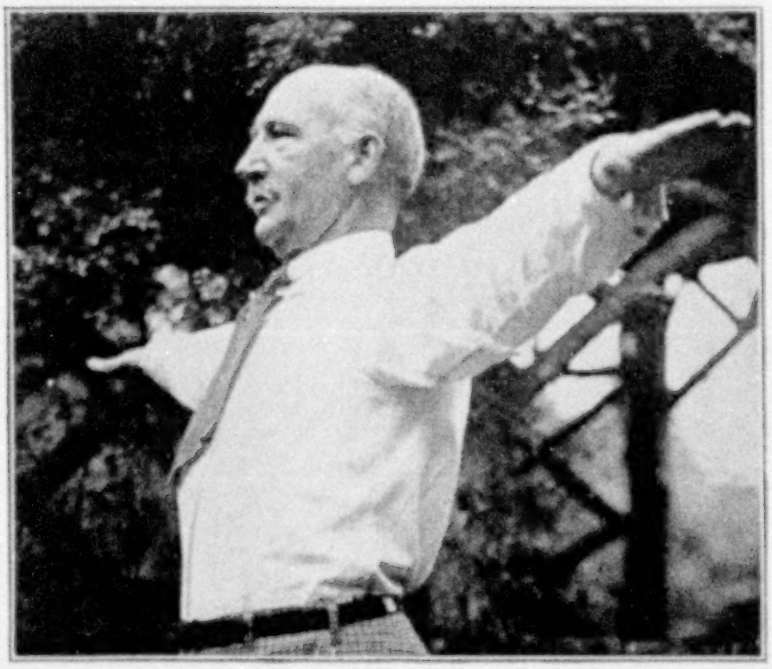
I went back in the car and found a man about 38 years old, white as a sheet, with a pulse of 110, and twitching all over. I learned that he had been managing a munitions plant and had broken down under the work, because he had transgressed all the laws of nature and given up all exercise, and had been working day and night.

"For God's sake," he said to me, "can't you put me to sleep? If somebody can only put me to sleep!" He was standing all bent over.

"Don't stand that way; stand this way!" I said, and I straightened him up and started putting him through a few exercises to stretch his body muscles. Pretty soon the color gradually began to come back into his face, and the twitching stopped. Then I said to him, "I am going to put you through the whole set of 'Daily Dozen' exercises once. Then I am going to send you back to your berth."

So I did that and didn't hear any more from him; but the next morning he came to me in the dining-car and said:

"You don't leave this train until you've taught me those exercises. I slept last night for the first time in five nights."



WALTER CAMP

Originator of the Famous "Daily Dozen" System

I taught him the "Daily Dozen," and two months later I got a letter from him, saying:

"My dear good Samaritan, I am back on the job all right again, and I am teaching everybody those exercises."

The "Daily Dozen" was originally devised as a setting-up drill for picked young men — the boys who were in training during the war. But its greatest value is for those men and women who are hemmed in between four walls most of the time and are beginning to realize that their bodies aren't as fit as their minds.

I applied it to middle-aged men, and men past middle age, too, during the war, including members of the Cabinet in Washington, who simply had to do much more work than they were used to doing without breaking down. In the "Daily Dozen" I soon found I had something that would actually increase their reserve power. They grew progressively more fit as we went along.

People think that they can take an orgy of exercise and make up for a long period of neglect when they do not take any exercise at all. You cannot do that. Do not go to a gymnasium. That tires you to death. That is old-fashioned. We do not have to do that any more. A man or woman can keep himself or herself fit with six or seven minutes a day. There is no reason why a man at 50 or 60 or 70 should not be supple; and if he is supple, then he grows old very slowly—*but the place where he must look after himself is in his body muscles."—Walter Camp.*

Mr. Camp is famous as a great Yale football coach and athletic authority, but few people know that he is also a successful business man.

Although sixty years old, he is stronger and more supple than most younger men, and he uses his own "Daily Dozen" exercises regularly in order to remain so.

Since the war, the "Daily Dozen" has been making busy men and women fit and keeping them so—and the exercises are now proving more efficient than ever—due to a great improvement in the system. This is it:

With Mr. Camp's special permission, all the twelve exercises have been set to music—on phonograph records that can be played on any disc machine.

In addition, a chart is furnished for each exercise—showing by actual photographs the exact movements to make for every one of the "commands"—which are given by a voice speaking on the record. So now you can make your phonograph keep you fit.

With these records and charts a man or woman can keep himself or herself fit with only a few minutes' exercise a day—and it is so much fun that some of the "Daily Dozen" fans go through the whole twelve exercises to the spirited music *twice* every morning—just as a matter of sheer enjoyment.

Mr. Camp says that the place where we must look after ourselves is in *the body or the trunk muscles.*

This is so because we are all in reality "caged animals." When a man stops hunting and fishing for his food and earns it sitting at a desk he becomes a captive animal—just as much as a lion or a tiger in the Zoo—and his trunk muscles deteriorate because they cease to be used. Then comes constipation and other troubles which *savage* men never have.

The remedy is to imitate the "exercises" of caged animals. *They* know how to keep themselves fit—and they do it, too.

How? Simply by constantly stretching and turning and twisting the trunk or body muscles! When Mr. Camp discovered that men and women can imitate the caged animal with enormous profit to their health, he devised the "Daily Dozen"—to provide this indispensable exercise—the only exercise people really need to keep in proper condition.

Many people have written to the Health Builders telling them of the benefits they have received. Here is part of one letter:

> "We wish to express our satisfaction and delight with our set of records and exercises. Our entire family of eight, including the maid, are taking them. The children are fascinated with them and bring the neighbors' children to do them.—Mrs. Charles C. Hickisch, 828 Vine St., La Crosse, Wis."

The Health Builders' improved system now includes the entire "Daily Dozen" exercises, set to specially selected music, on large 10-inch double-disc phonograph records; twelve handsome charts, printed in two colors, with over sixty actual photographs illustrating each movement of each exercise; and a little book by Walter Camp explaining the new principles of his famous system.

Any man or woman who exercises with this system regularly, even if it is only six or seven minutes a day, will feel better and have more endurance and "pep" than they have had since they were in their 'teens—and they will find those few minutes the best fun of their day.

Sample Record FREE

You can see for yourself what Walter Camp's New Way to Exercise will do for you—without a dollar of expense.

We will send you, entirely free, a sample phonograph record carrying two of the "Daily Dozen" exercises, set to music, with a splendid voice giving the commands for each movement. In addition you will receive a free chart showing the two exercises and giving simple but complete directions for doing them.

If you are a business or professional man or woman you need a body that keeps step with your brain, and you certainly will want to try out this system of exercises that has proved the most efficient ever devised. Get this free "Health Builder" record, put it on a phonograph, and try it out. There is no obligation—the record is yours to keep. You need not return it. Just enclose a quarter (or 25 cents in stamps) with the coupon, to cover postage, packing, etc. Send the coupon—today—now.

HEALTH BUILDERS

Dept. 184

Oyster Bay New York

Health Builders
Dept. 184, Oyster Bay, New York

Please send me your free sample "Health Builder" record, giving two of Walter Camp's famous "Daily Dozen" exercises; also a free chart containing actual photographs and simple directions for doing the exercises. I enclose a quarter (or 25 cents in stamps) for postage, packing, etc. This does not obligate me in any way, and the sample record and chart are both mine to keep.

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(Please write plainly)

Address .....

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Few flowers, whether used for garden decoration or principally for cut blooms to decorate the home, are as responsive to simple garden culture as our Modern Dahlia. It has made wonderful advancement in size and bloom, habit of growth and profuse blooming qualities.

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Order Your Tubers Now so as to have them ready to plant any time after the tenth of May or when all danger of frost is past.

Mail this advertisement with check, money order, cash, or stamps and secure this exceptional collection, sent prepaid to any point in the United States.

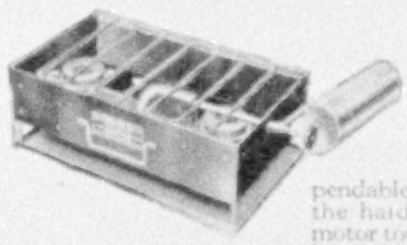
Our 1922 Spring Seed Annual sent on request

Stumpp & Walter Co

30 and 32 Barclay Street New York

Use GAS For Your Camp Cooking

KAMPKOOK makes its own gas from the same grade of gasoline you use in your car. Gives a quick, hot, blue flame enabling the motor tourist and camper to cook out in the open as conveniently as at home. Set up and going full blast in two minutes. Windproof, safe, dependable; built to stand the hard knocks. More motor tourists use Kampkook than any other kind of camp fire. Sold by dealers in sporting goods everywhere.

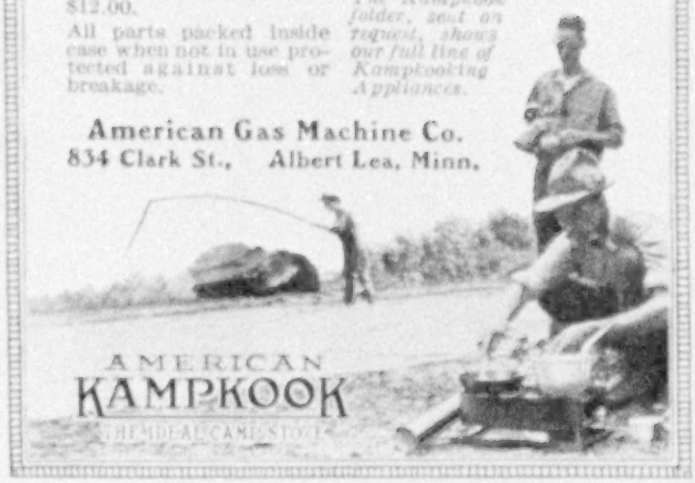


Kampkook No. 3
Most popular size. Measures 3½ x 9 x 15 inches folded, weighs 8 pounds. Price $7.50; large size $8.50; three burner size $12.00.

All parts packed inside case when not in use protected against loss or breakage.

The Kampkook folder, sent on request, shows our full line of Kampkooking Appliances.

American Gas Machine Co.
834 Clark St., Albert Lea, Minn.



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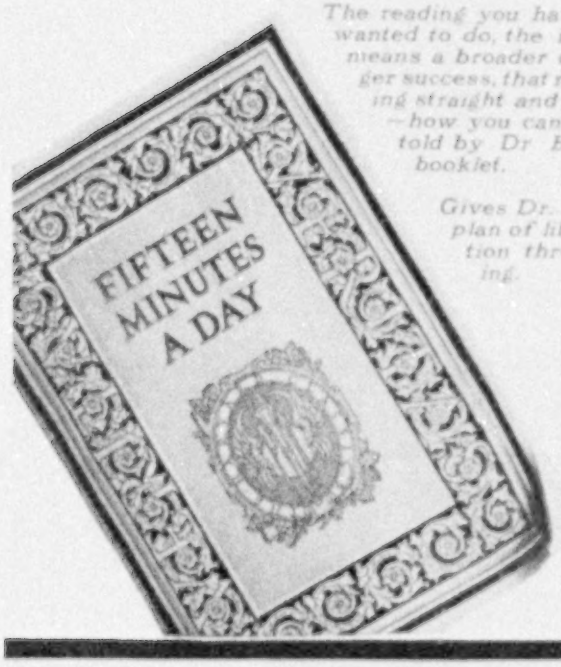

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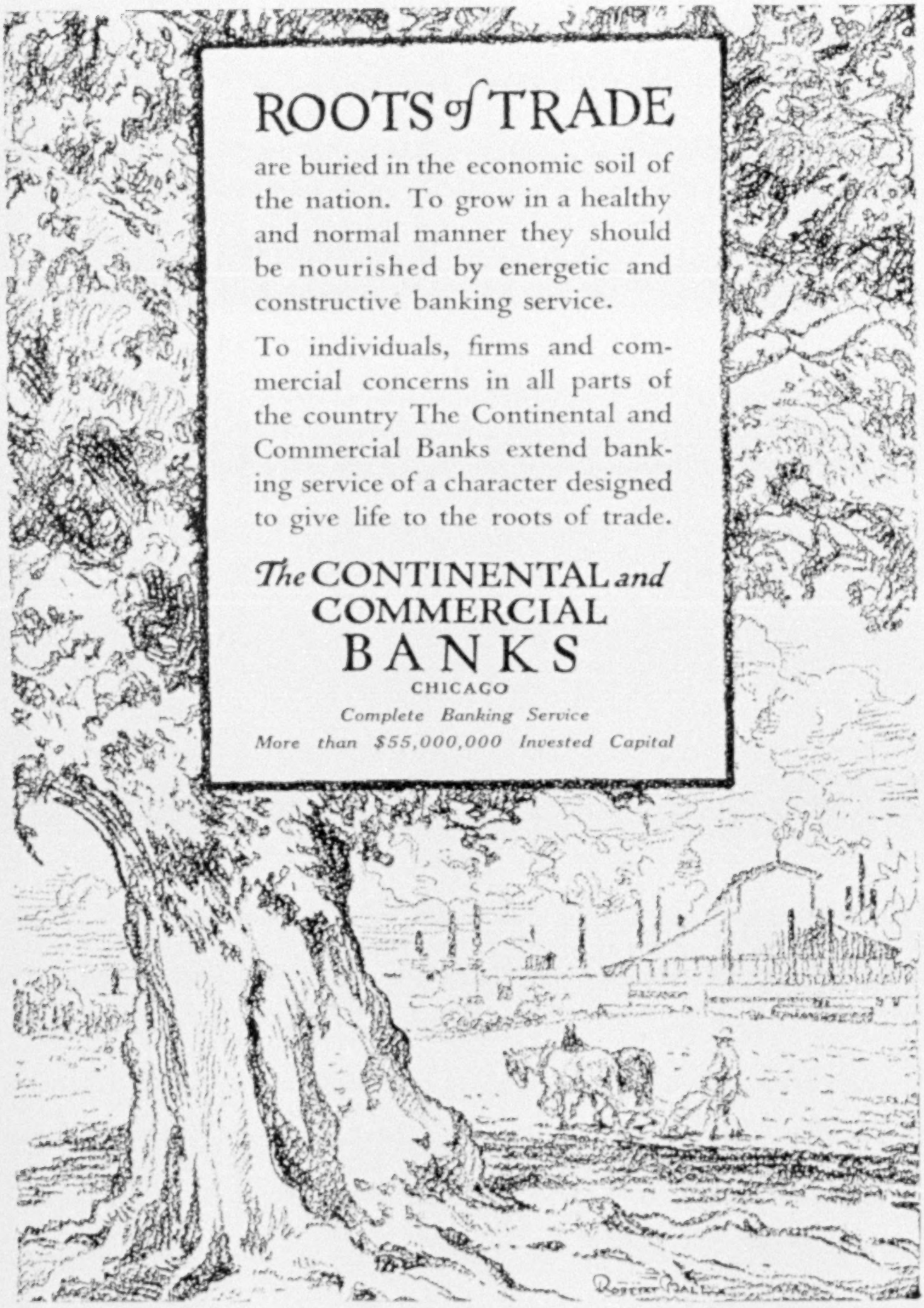

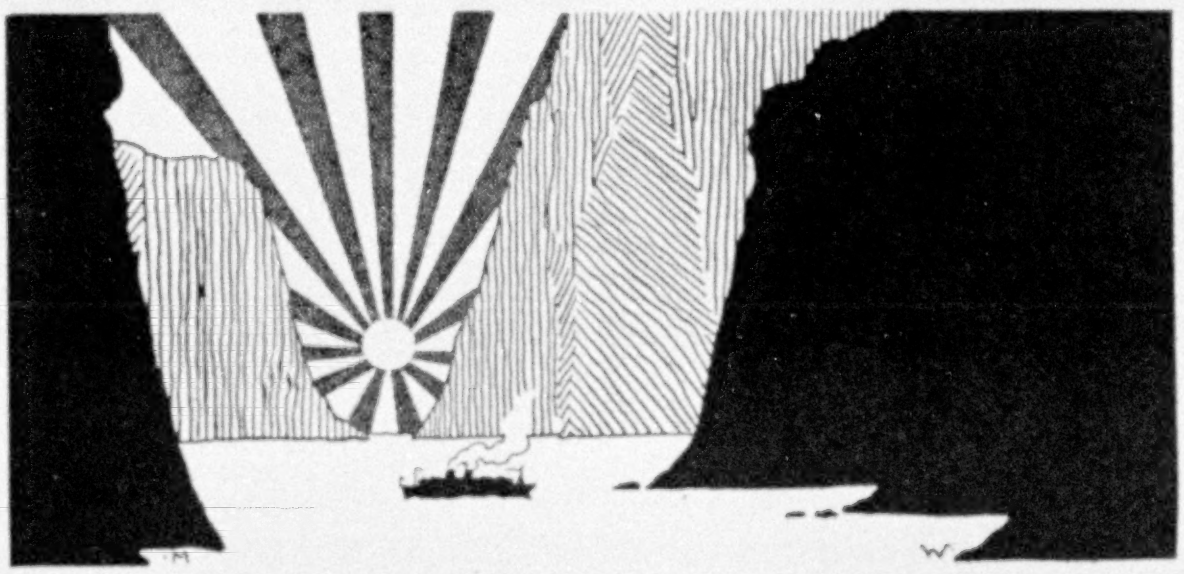

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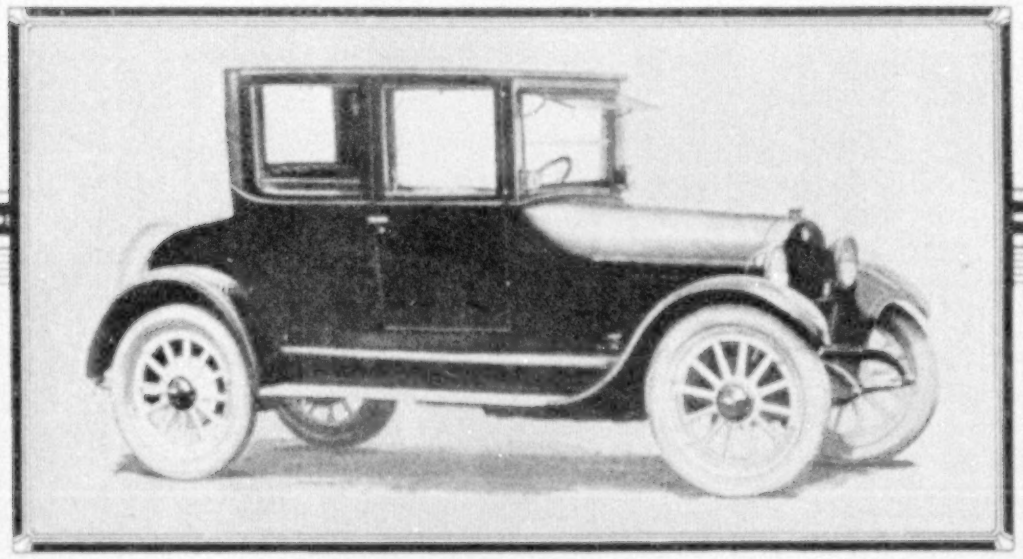

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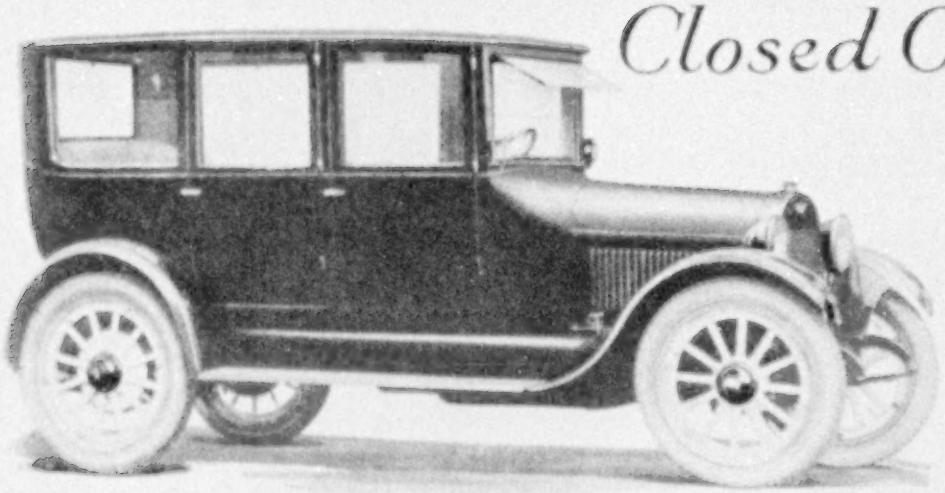

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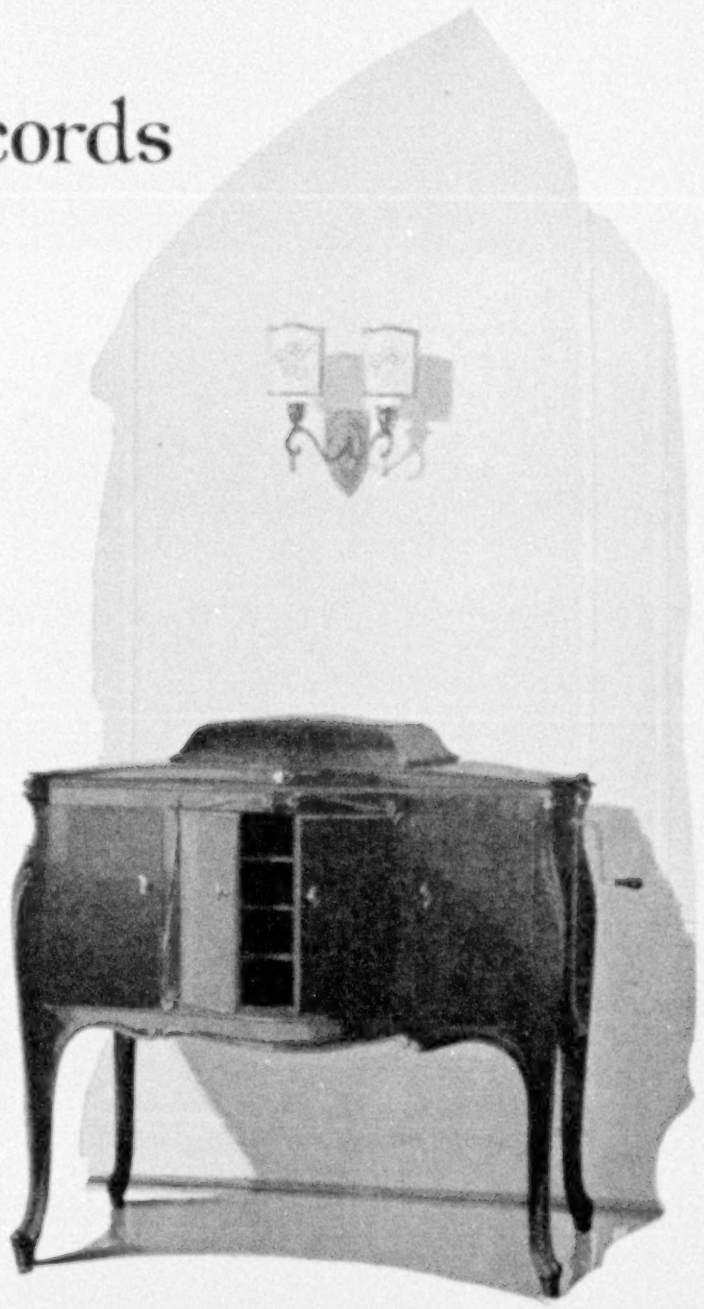

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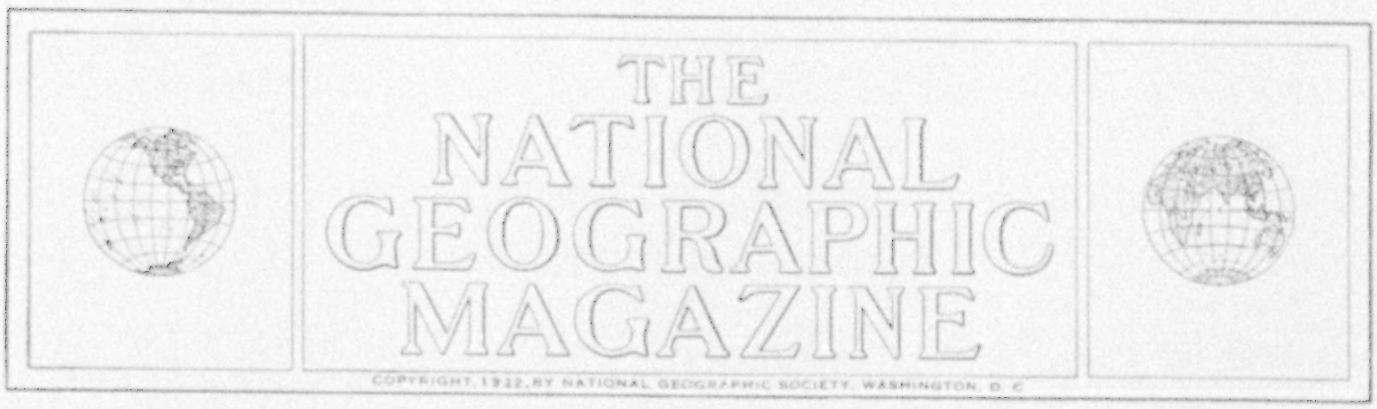


THE SCENERY OF NORTH AMERICA

BY JAMES BRYCE (VISCOUNT BRYCE)

AUTHOR OF "IMPRESSIONS OF PALESTINE," "THE NATION'S CAPITAL," "TWO POSSIBLE SOLUTIONS FOR THE EASTERN PROBLEM," AND "WESTERN SIBERIA AND THE ALTAI MOUNTAINS," IN THE NATIONAL GEOGRAPHIC MAGAZINE

The following article was probably the last work written for publication by the distinguished scholar and statesman whose remarkable career came to a close in his eighty-fourth year, on January 22, 1922. James Bryce was a frequent contributor to the NATIONAL GEOGRAPHIC MAGAZINE *and an interested and helpful factor in all other activities of the National Geographic Society, on whose Committee of Research he served during his residence in Washington as the British Ambassador, his counsel and advice proving invaluable in the Society's preparation for the successful Peruvian expeditions which found and unearthed Machu Picchu, the Lost City of the Incas. Every scene mentioned in this article had been visited by Viscount Bryce, the news of whose death was received with profound sorrow throughout the United States, which he loved so well.*—THE EDITOR.

THIRTY-FIVE years ago, when I was occupied in writing on the political and social institutions of the United States, it was a part of my plan to give some account of the scenery of North America, finding in it a feature of the country which will continue through all the ages to affect the mind of its inhabitants.

For this task, however, time failed me, while the book that embodied my political observations grew to a length that made it impossible to make room for descriptions of Nature as well as of the doings of man.

Today, invited by my friend, the Editor of the NATIONAL GEOGRAPHIC MAGAZINE, to a less ambitious task, that of writing something short and simple about the broad characteristics of the American scenery, I present in response to his call a few observations on those general aspects of the American landscape which have most interest for the lover of natural beauty, and especially of mountain beauty and mountain grandeur.

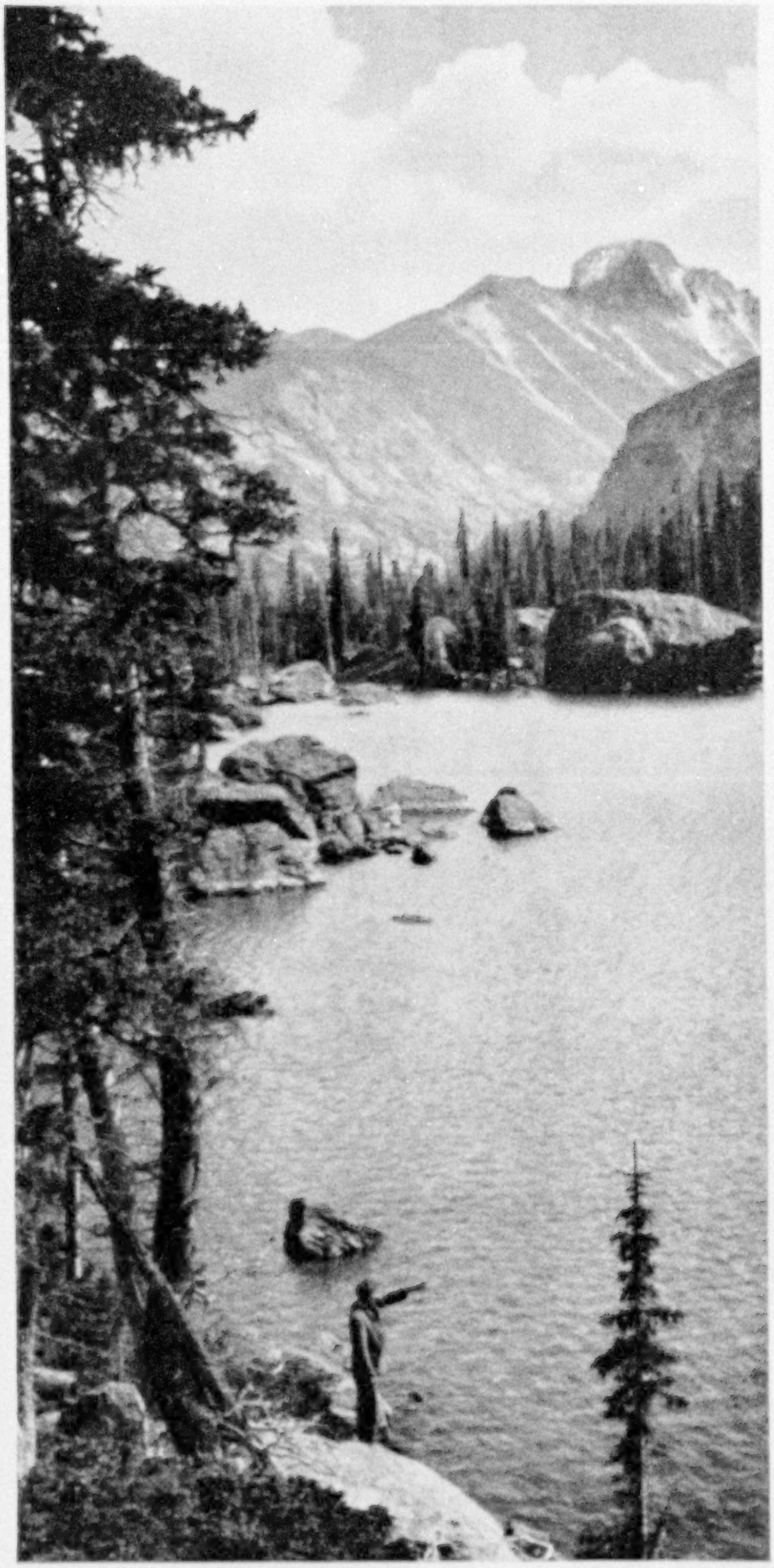
EVERYTHING IN AMERICA IS ON A GREAT SCALE

First, let me, to use the famous phrase of Alexander Hamilton, "try to think continentally."

Everything in America is on a great scale, as great as that of Asia, far greater than that of Europe, which is the part of the world whose scenery most Americans, as nearly all Englishmen, know best.

The American rivers are of immense length and volume. The lakes, or rather inland seas, are, with the exception of the Caspian, the largest in the world.

America's mountain ranges exceed those of Asia, the Rocky Mountains from New Mexico to near the frontier of Alaska being more than twenty-five hundred miles in length, as against the Himalayas of about fifteen hundred from the Indus at Attock to the point where the Tsanpo



Photograph by George C. Barnard, from Colorado Mountain Club

LONGS PEAK FROM LAKE HAIYAHA: ROCKY MOUNTAIN NATIONAL PARK, COLORADO

Lying between Hallett Peak and Otis Peak, Haiyaha is one of the most picturesque rock-bound lakes in the United States

turns south out of Tibet to become the Brahmaputra in Assam. The Alleghenies are longer than the Alps, and so are the Sierra Nevada and Cascade Mountains, practically one continuous range.

This vast scale gives a large number of places in which such beauty as rivers and mountains display can be enjoyed, but it does not necessarily make more beauty. That depends upon other factors besides that of size, the chief of which are fineness of form and richness of color.

Mountains, lakes, and rivers are the three features of scenery which most contribute to natural beauty, and of these three mountains are the most important, the quality of river scenery and lake scenery depending mainly on the character of their banks, whether these be low and monotonous or bold and varied. But before we come to the mountains, a few words may be said on the rivers, because their volume does have a grandeur of its own apart from the land through which they run.

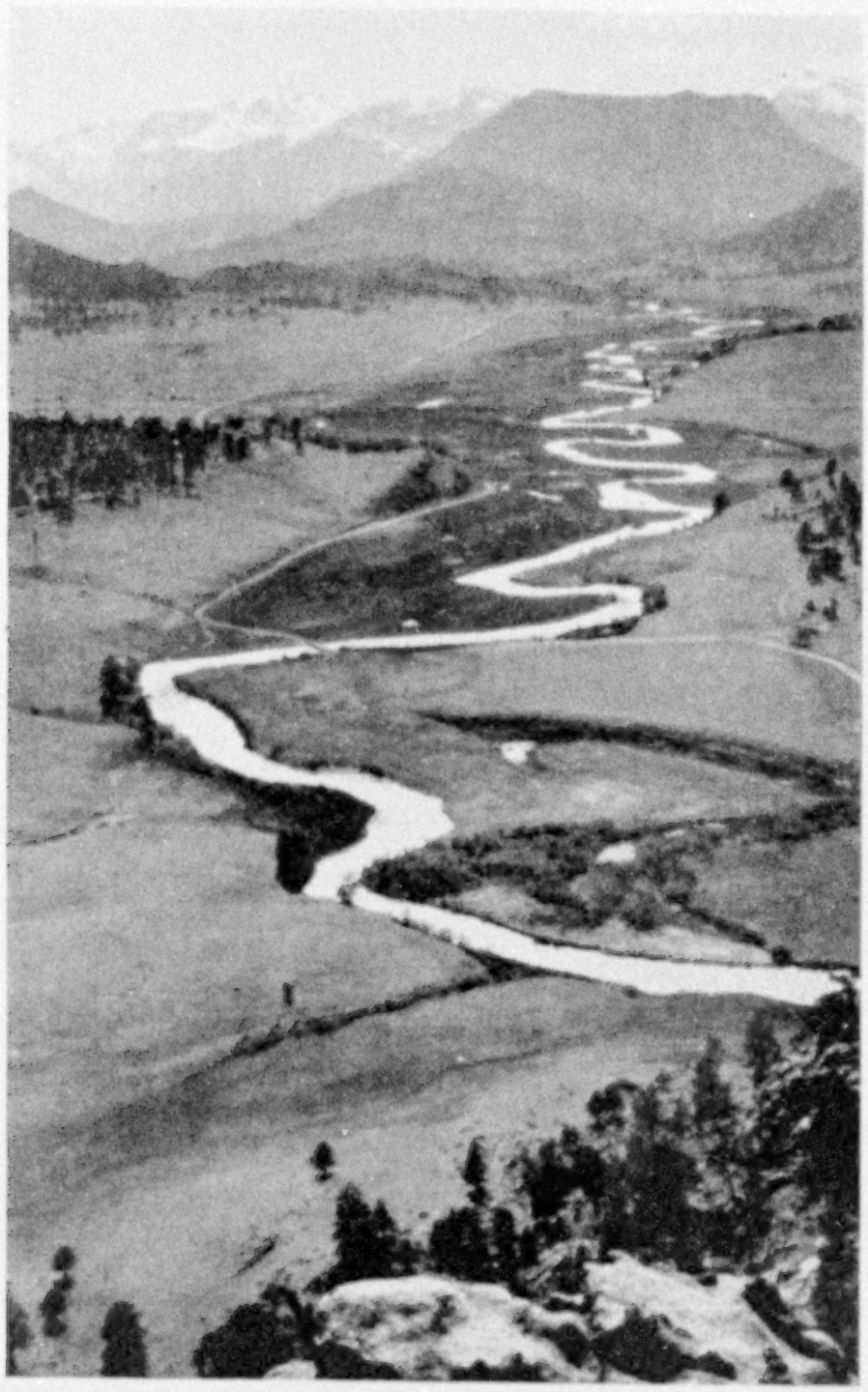
THE GRANDEUR OF GREAT STREAMS

The two greatest American rivers, the Mississippi (including its chief affluents) and the St. Lawrence, have this grandeur. One cannot sail upon or look down from a height upon either of these two mighty streams without being awed by the pro-

digious force that dwells in their currents.

The expanse of the St. Lawrence, as it roars down the rapids above Montreal, the broad bosom of the Mississippi, with a thousand yellow eddies, as it sweeps in great curves past New Orleans, have a grandeur all their own. Neither the Nile nor the Volga nor the Obi nor the Indus conveys the same impression of resistless power. Only the Yangtze has a like air of majesty, and this may be due to the sense that it is more closely than most streams associated with human life, because no other bears so many vessels.

As respects river beauty, besides the cliffs on the upper Missouri and Yellowstone, there was fifty years ago a charming stretch of more than two hundred miles along the Mississippi between St. Paul and Dubuque, the slopes, three to four hundred feet high, covered by natural woods growing in comparatively open clumps, while the river swept in graceful curves from one to the other set of bluffs across the valley, which gradually widened as it descended from a mile to over seven or eight miles. This scenery could be enjoyed only from a vessel, and I believe that now, since there are railroads on both sides, the passenger steamers no longer ply.



Photograph by A. Haanstad, from Colorado Mountain Club

BIG THOMPSON RIVER SNAKES ITS WAY THROUGH ESTES PARK

In the background loom Deer Mountain and the Continental Divide.

Below St. Louis the heights that bound the river valley being usually lower and more distant from the stream, the banks are not very interesting. Neither are those of the St. Lawrence, except at some points, such as is Quebec.

The five Great Lakes have almost everywhere low shores, but Georgian Bay, the northeastern bight of Lake Huron, contains many picturesque rocky and wooded islands, and there are some forty or fifty miles of bold craggy heights on the north coast of Lake Superior, sometimes rising to grandeur.

But Lake Champlain is a noble sheet of water as seen from the hills of Vermont, with the Adirondack peaks rising behind it (see page 363).

The beauties of Lake George and of its very dissimilar sister, Lake Tahoe, in California, are well known.

Now we come to the mountains: They

© Asahel Curtis

LANE PEAK: MOUNT RAINIER NATIONAL PARK

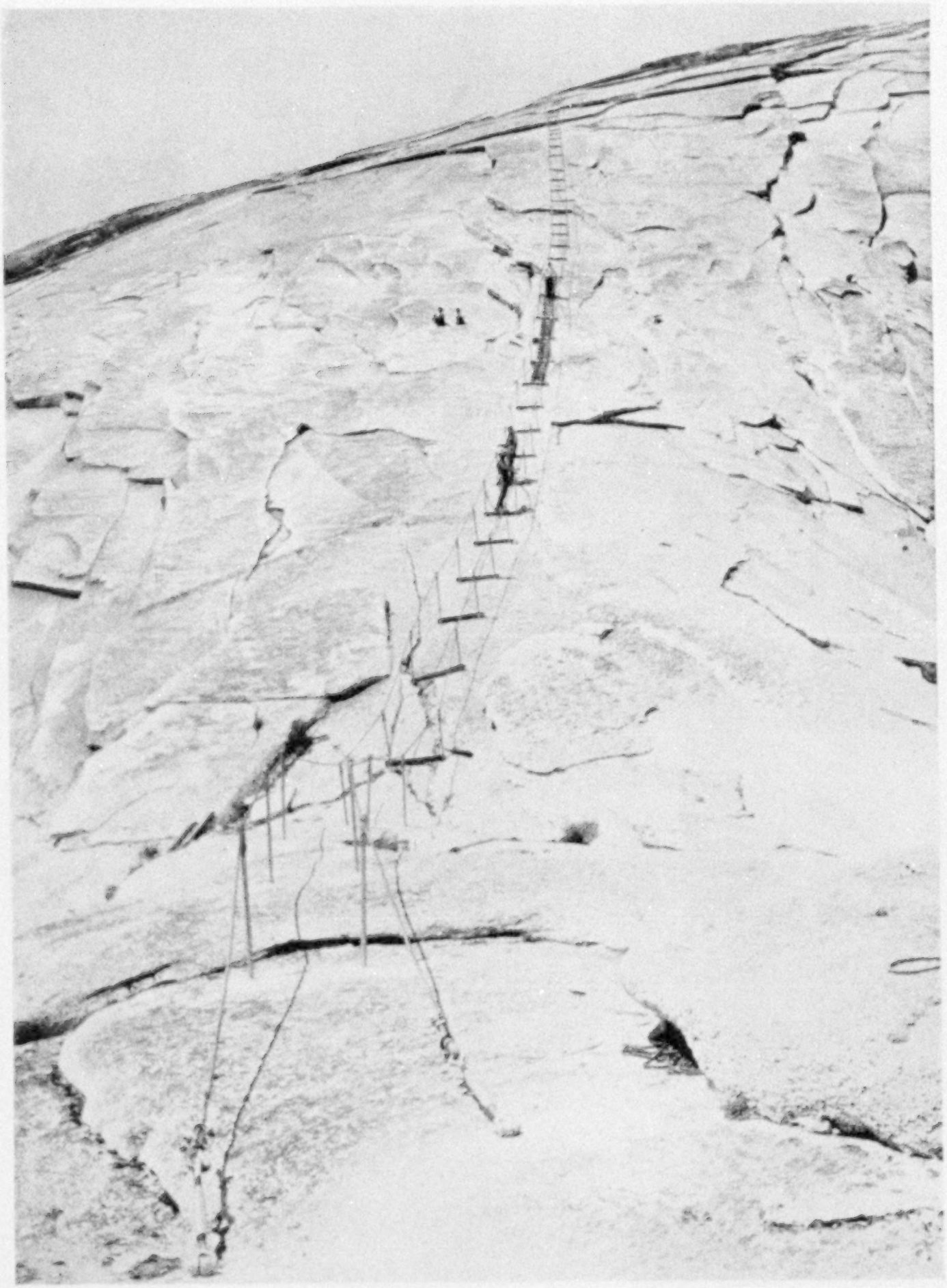
The United States Geographic Board recently named this peak of the Tatoosh Range in honor of the late Franklin K. Lane, former Secretary of the Interior and for many years a member of the Board of Trustees of the National Geographic Society (see his "Mind's-Eye Map of America," in the NATIONAL GEOGRAPHIC MAGAZINE for June, 1920).

XUM

Photograph from M. Hall McAllister

HALF DOME, A MONOLITH OF GRANITE, RISING 5,000 FEET ABOVE THE FLOOR OF THE VALLEY: YOSEMITE NATIONAL PARK

Until 1875 this peak was believed to be unscalable, but in that year George Anderson, a former sailor, succeeded in climbing it. He accomplished the feat in ten days by drilling holes and setting eyebolts in the rock. In recent years the Sierra Club of California has installed a cable stairway to the top, utilizing Anderson's method (see also illustrations, pages 344, 345, 347, and 380). Note the tree at the right, its roots anchored in granite.



Photograph from M. Hall McAllister

THE CABLE STAIRWAY, 800 FEET LONG, LEADING TO THE SUMMIT OF HALF DOME: YOSEMITE NATIONAL PARK

At the close of the summer season the steel posts are removed and stored; otherwise they would be swept away by the irresistible spring avalanches (see also illustrations on pages 343, 345, 347, and 380).

Photograph from M. Hall McAllister

CLIMBERS ASCENDING HALF DOME WITH THE AID OF CABLES

Tennis or rubber shoes are worn to prevent slipping on the smooth granite. This view also shows the heavy safety chains with which the stairway is anchored to the rock (see illustration on preceding page).

count for most, not because there is not just as much genuine beauty to be found among soft hills and rolling pastures and along the banks of streams in wooded dales, but because size is an element in grandeur, and grandeur impresses those who are insensible to the gentler charms of landscape.

FIVE GROUPS OF MOUNTAIN MASSES OF NORTH AMERICA

The mountain masses of the United States may be divided into five groups: the Rockies, the Sierra Nevada, continued in the Cascade Range of Oregon and Washington, the Coast Range of California and Oregon, the Alleghenies, and those scattered heights which extend from northern Pennsylvania to New Brunswick. To them belong the Adirondacks of New York, the Green Mountains of Vermont, the White Mountains of New Hampshire, as well as the unnamed heights of western Massachusetts (culminating in Greylock) and the loftier summits of central Maine, culminating in Katahdin.

The Rocky Mountains are the backbone of the continent, a wide belt of highlands sometimes sinking into plateaus of from 5,000 to 8,000 feet, sometimes rising into peaks which carry some snow all the year.

The highest summits are found in Colorado, where many stand pretty close together. About forty exceed 14,000 feet, but none seem to reach 14,500. This uniformity of elevation and the absence of striking forms make the Colorado groups less interesting to the climber or painter

than might be expected from their height, while the dryness of the climate prevents accumulations of snow sufficient to feed glaciers. Few have forms sufficiently noble and peculiar to give them individuality.

Thus, though the number of peaks above 14,000 feet is double that to be found in the Alps, there are none that have that striking and distinctive quality which belongs to the Matterhorn, the Weisshorn, the Finsteraarhorn, and Schreckhorn, or even to lower peaks such as the Venediger Spitze, the Cimone della Pala, and the Sasso di Pelmo.

Pikes Peak, Colorado, the high point most conspicuous from the plains, and toward which, as a landmark visible far off to the east, many of the early settlers were directing their wagons seventy years ago, is a singularly tame and featureless object. Though the trees scattered over those rolling grassy uplands called the prairies give an element of beauty, the dry climate stunts the growth of forests and prevents them from enriching the landscape with sufficient verdure and variety.

COLORADO'S VALLEYS UNSURPASSED IN GRANDEUR

Along with these defects, however, the Colorado Rockies have one feature of unsurpassed grandeur. What the hills do not give is given by the valleys. The deep and extremely narrow ravines which intersect the mountains, enclosed by precipitous walls thousands of feet high, with nothing at the bottom but a roaring stream and sometimes a road, or a railway carried on a shelf cut out of the face of the precipice—these have sometimes a grandeur and sometimes a picturesque variety of views up and down the winding glen unsurpassed in any part of the Western Hemisphere.

The so-called Royal Gorge of the Arkansas River, just where it issues from the mountains west of Pueblo, is perhaps the most tremendous in the sternness of its crags and pinnacles, but there are others hardly less wildly grand.

North of Colorado the range of the Rockies sinks, but some high peaks occur in northwestern Wyoming, and the scenery of the Yellowstone Lake and Yellowstone Canyon, with its splendid waterfalls, as well as that of the Geyser Basins, is extremely interesting.

Still further north, on the frontier line between the State of Montana and Canada, lies a district of great beauty, with snow-covered peaks, occasionally bearing small glaciers and picturesque lakes filling some of the valleys. Here the creation of a national park has happily provided for the preservation both of the scenery and of the wild animals.

From this point, where the Canadian Rockies begin, the tourist finds plenty of fine scenery for hundreds of miles to the north. The mountains do not reach the height of those in Colorado, but as the rainfall is heavier and snow-line is much lower, considerable glaciers appear, and the mountain forms are much bolder and more varied. Here the forests are denser and the streams fuller, especially on the west side of the range, which receives more rain.

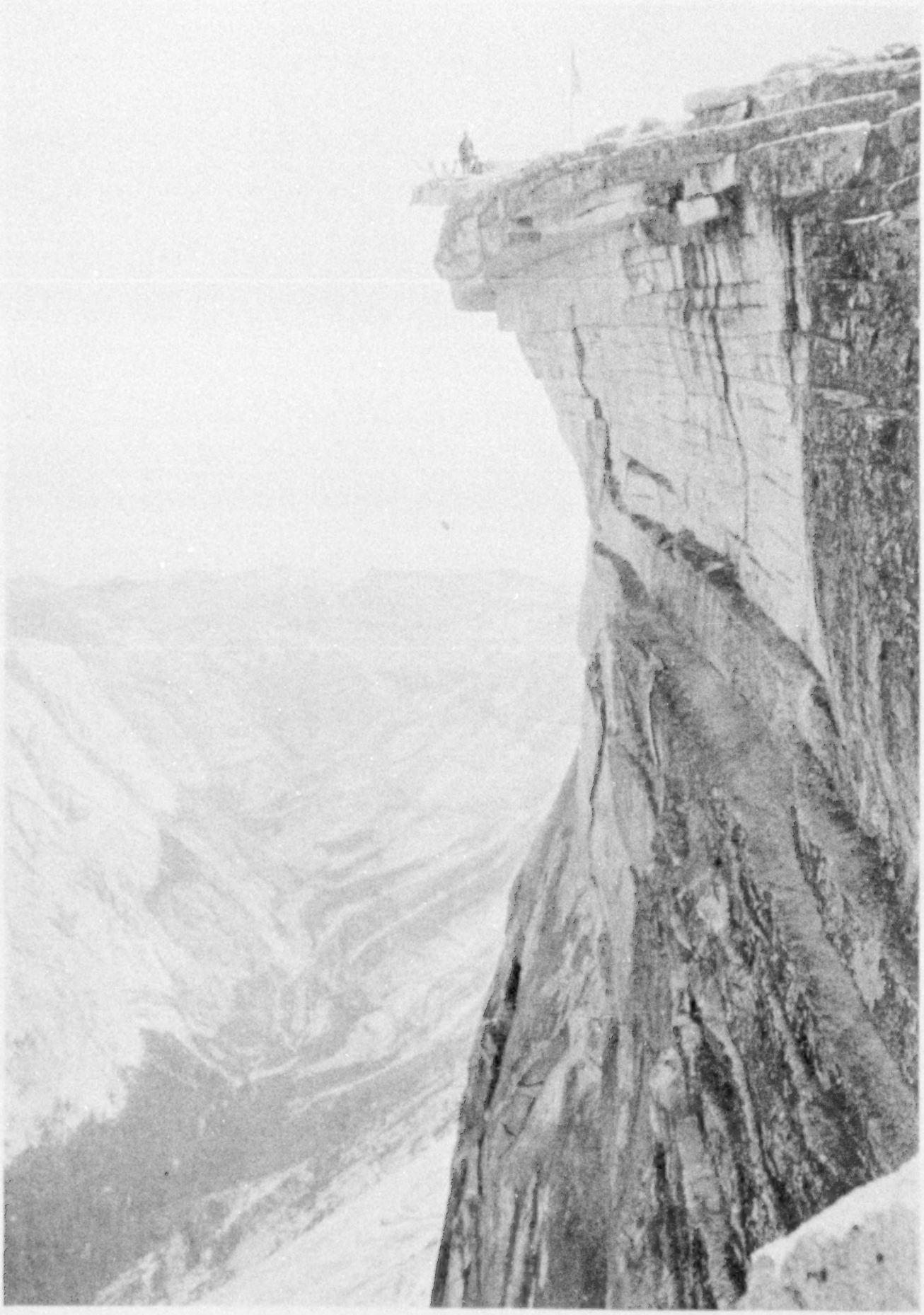
All this region north of the Canadian Pacific Railway is still very imperfectly explored and offers to climbers the chance of discoveries, together with ample scope for dangerous rock and ice work—forms of enjoyment now fashionable. Its scenery resembles that of the Alps more nearly than does any other part of North America.

THE CANYONS OF THE WEST

From the Rockies let us turn westward across the Great American Desert to the parallel range of the Sierra Nevada in California. As its name conveys, it carries perpetual snow, but not enough snow to support glaciers, though these may be found in its prolongation into Oregon and Washington, where it bears the name of the Cascade Range.

Like the Rockies of Colorado, it has one or two summits exceeding 14,000 feet, but none reaching 15,000 feet; and, like them, it displays few peaks conspicuous by any nobility or grace of form. Seen from the wide valley or plain of central California on the west, the skyline of the range is of nearly uniform height and disappointingly tame.

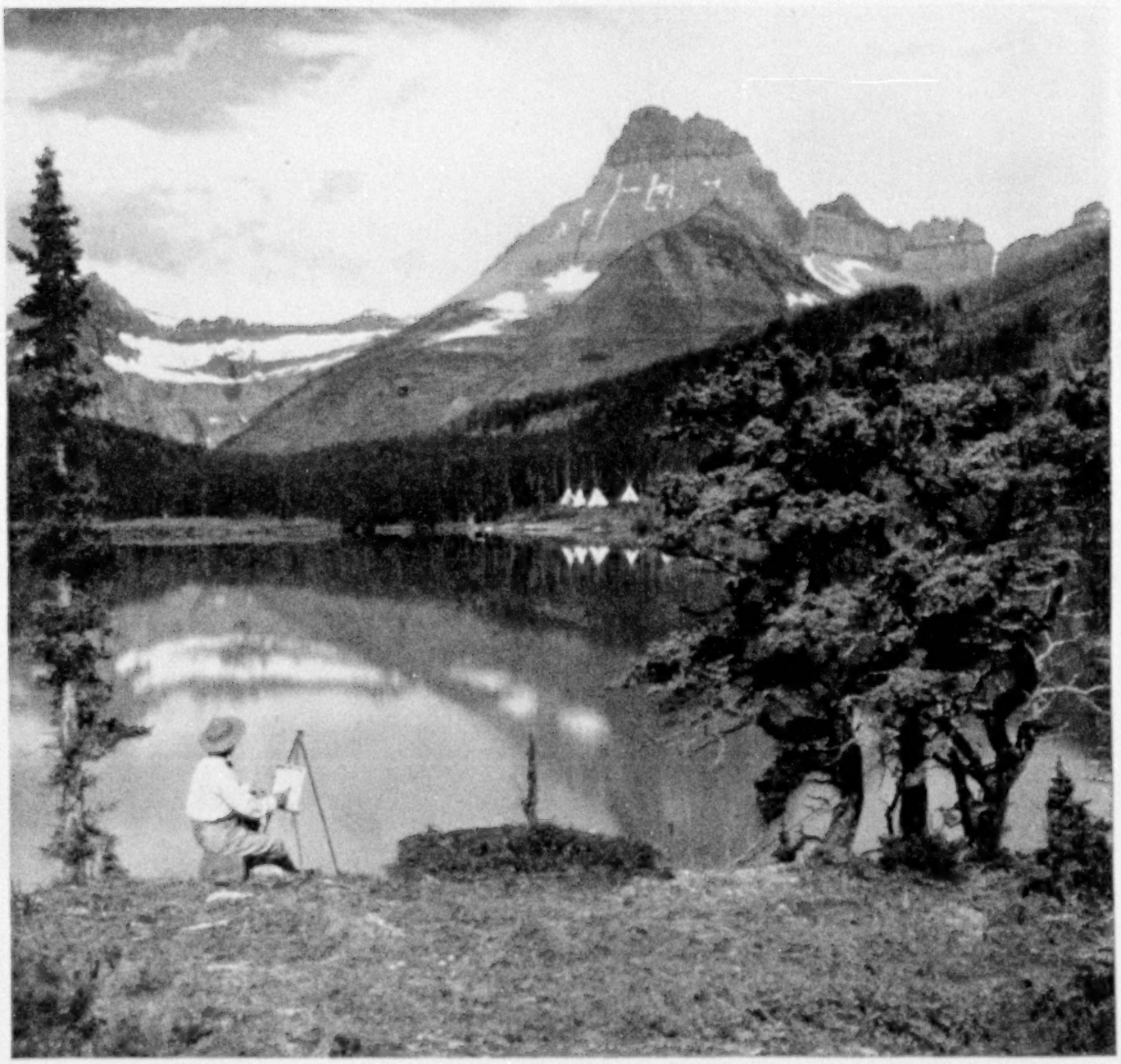
The canyons, however, are of extraordinary beauty, sometimes, as in the Yosemite Valley and the Kings River Canyon, presenting forms of singular grandeur.



Photograph from M. Hall McAllister

THE OVERHANGING LEDGE AT THE SUMMIT OF HALF DOME: YOSEMITE VALLEY

The flag and steel pole are nearly 5,000 feet above Mirror Lake, which lies at the base of Half Dome.



Photograph by Haynes, St. Paul

TRANSFERRING TO CANVAS SOME OF THE UNSURPASSED BEAUTIES OF GLACIER NATIONAL PARK

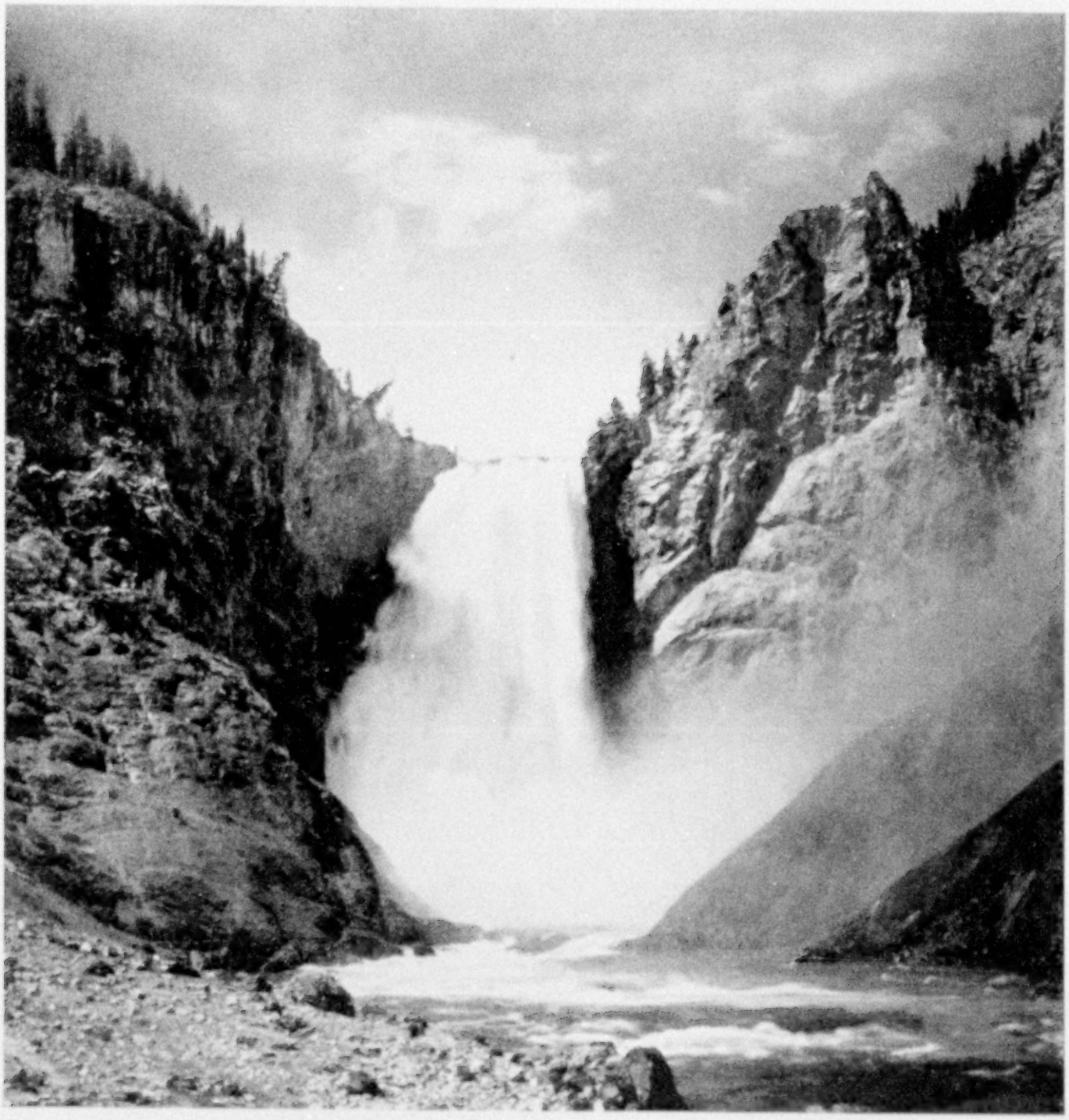
At the artist's feet stretches the mirror surface of Lake McDermott, which reflects the towering grandeur of Mount Wilbur in the distance. Note the white tents of summer visitors in the middle distance.

It would be hard to find anywhere scenery more perfect. Lofty vertical walls of gray granite inclose a valley from half a mile to a mile wide, on whose level grassy floor tall trees rise along banks of an exquisitely clear-watered, gently flowing river. Waterfalls fling themselves over the edges of the cliffs (see page 349).

MAJESTY OF PRECIPICE AND BEAUTY OF VALE COMBINED

The majesty of the precipices combines with the soft beauty of the vale to produce an effect such as it would be hard to find anywhere in Europe, though perhaps the Romsdal in Norway and the Val di Genova in the Italian Alps northeast of Brescia come nearest. In the latter, however, the scale is smaller, while the grim sternness of the Romsdal is not relieved by trees and meadows basking in sunshine like that of the Yosemite, even among its mountains. California remains a sunny land.

In Oregon and Washington the monotony of the outline which the average level of the Cascade Range presents (about 6,000 to 7,000 feet) is broken by



Photograph © Albert Schlecten

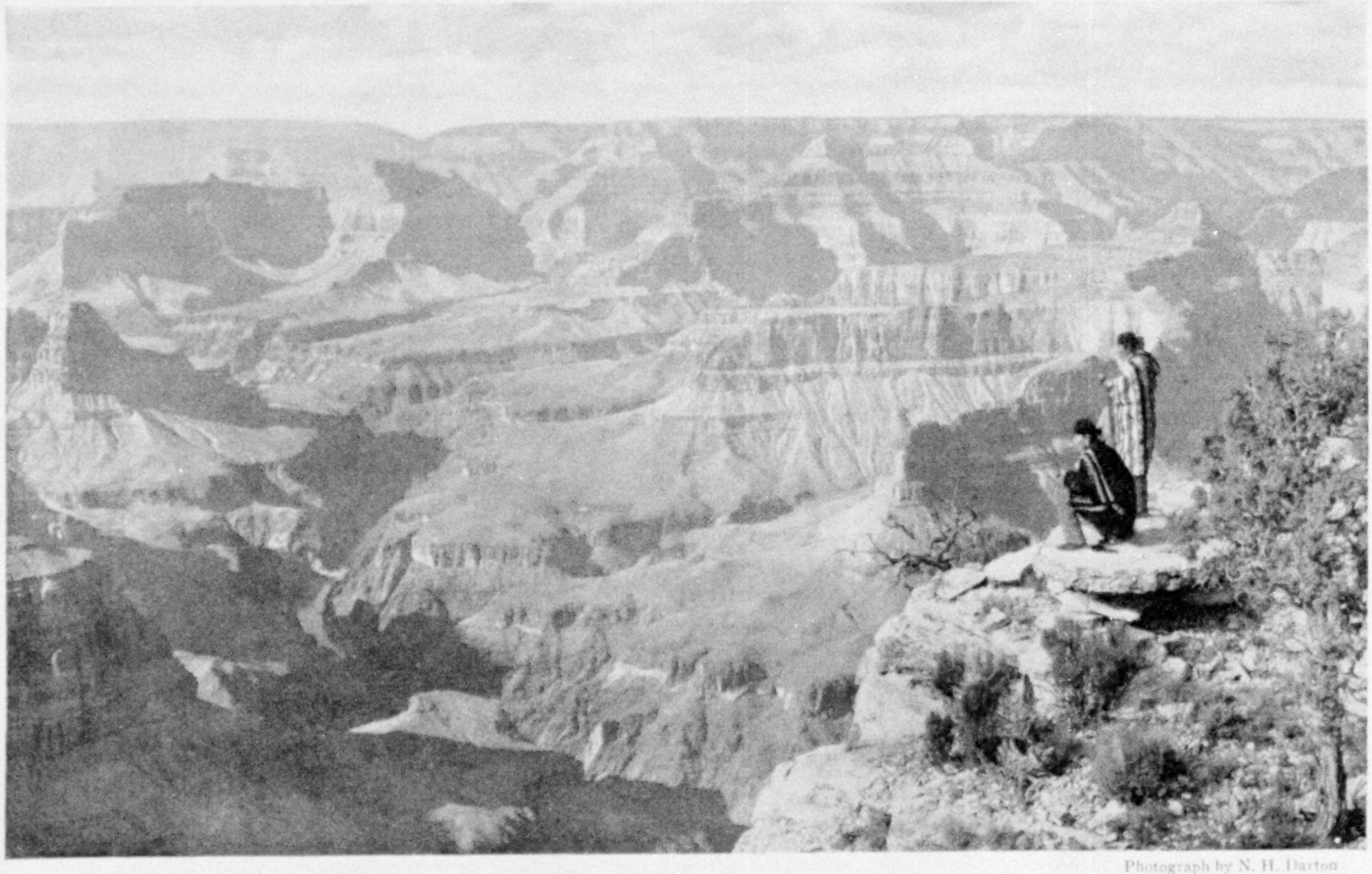
THE GREAT FALLS OF THE YELLOWSTONE: YELLOWSTONE NATIONAL PARK

This majestic cataract marks the beginning of the Grand Canyon of the Yellowstone, which extends for twenty miles between walls of gorgeous coloring, ranging in height from 600 to 1,200 feet. The water of the Great Falls makes a plunge nearly twice as high as Niagara.

several huge snow-capped summits, the finest of which are Mount Hood, well seen from the city of Portland, and Mount Rainier, south of Seattle. Seen from the opposite or western coast of Puget Sound, Mt. Rainier is a truly magnificent object, towering to a height of 14,408 feet, with glittering glaciers streaming down its slopes till they almost touch the thick dark forest beneath—a vast forest, impenetrable, except where trails have been cut, in which nearly every tree, Douglas firs and so-called "cedars" (*Thùja gigantea*), rises 300 feet into the air.

These superb evergreen conifers, along with the two *Sequoias* of California, the one (the Redwood) the tallest and the other (the so-called "Big Trees" of the Yosemite and Sequoia National Parks) the thickest-stemmed trees in the world,* are the glory of the Pacific coast not only

* Except, perhaps, the "Water Cypress" (the native Ahuehuete) of Mexico, the stem of which is not tall, but of prodigious girth.



Photograph by N. H. Darton

WHERE BEAUTY AND GRANDEUR ENHANCE ONE ANOTHER: GRAND CANYON NATIONAL PARK

Looking into the depths of the Grand Canyon and to the far-distant northern brink, opposite Pima Point. The river, more than 500 feet wide here, is over a mile below the Indians (see text, page 370).

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Photograph from George F. Paul

AT THE "SADDLE" ON THE PIKES PEAK COG ROAD

This summit of the Rockies, conspicuous from the plains to the east, was a landmark for the early settlers westward-bound seventy years ago.

Photograph © Asahel Curtis

COASTING IN PARADISE PARK, MOUNT RAINIER NATIONAL PARK: WASHINGTON

Though not so widely exploited, the United States in many sections from East to West has winter sports as picturesque as those of Switzerland.

Photograph © Asahel Curtis

IN A WASHINGTON STATE WHEAT FIELD

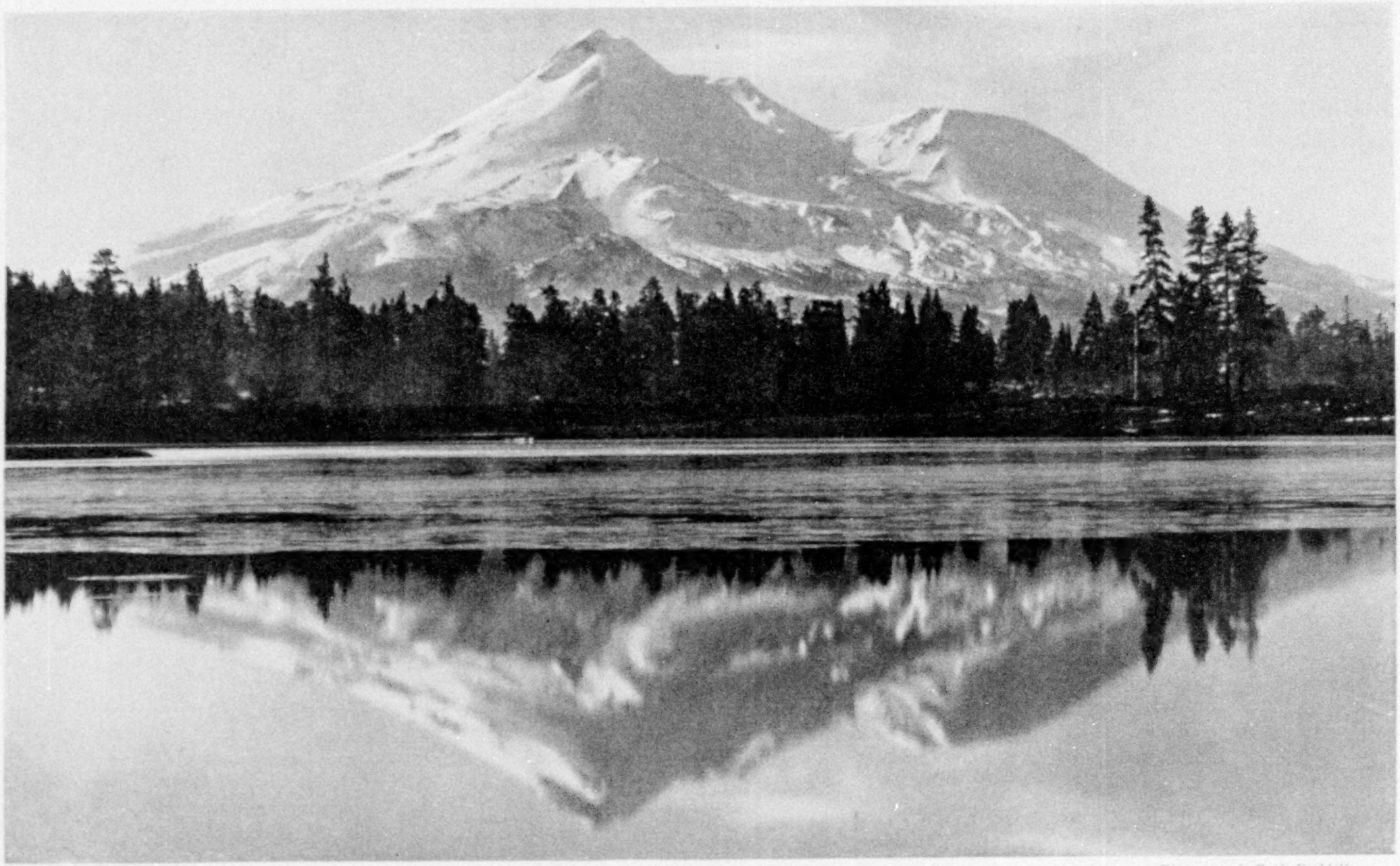
in their size, but also in the stateliness of their aspect, far transcending any trees of Europe, and approached only by a few in Australia, in tropical South America, and in the islands of Further India.

BEAUTY IN THE FOREST-CLAD SLOPES OF THE EAST

From these western peaks and forests let me lead the reader back to those of the Atlantic side of America, where also we shall find another type of scenery with its own peculiar charms, less sensational, but not less enjoyable by those who know how to enjoy.

The Appalachian mountain masses are as unlike the mountains of Colorado and California as they are unlike those of Europe, for, though they are in the same latitude, climate and vegetation as well as rock-structure are different.

In the Alleghenies there is nothing to suggest the Alps or the Pyrenees or the Caucasus, but sometimes one is reminded of the Swiss and French Jura. They are, when one crosses them from east to west or west to east, a succession of smooth-topped ridges, generally parallel to one another, but with transverse ridges here and there, the average height above sea-



Photograph © C. R. Millie

CHASTE SHASTA ADMIRES HER IMAGE IN GRASS LAKE

This snow-covered pile, which rises to a height of 14,162 feet in northern California, is the cone of an extinct volcano. Its northern slope is seamed with minor glaciers.

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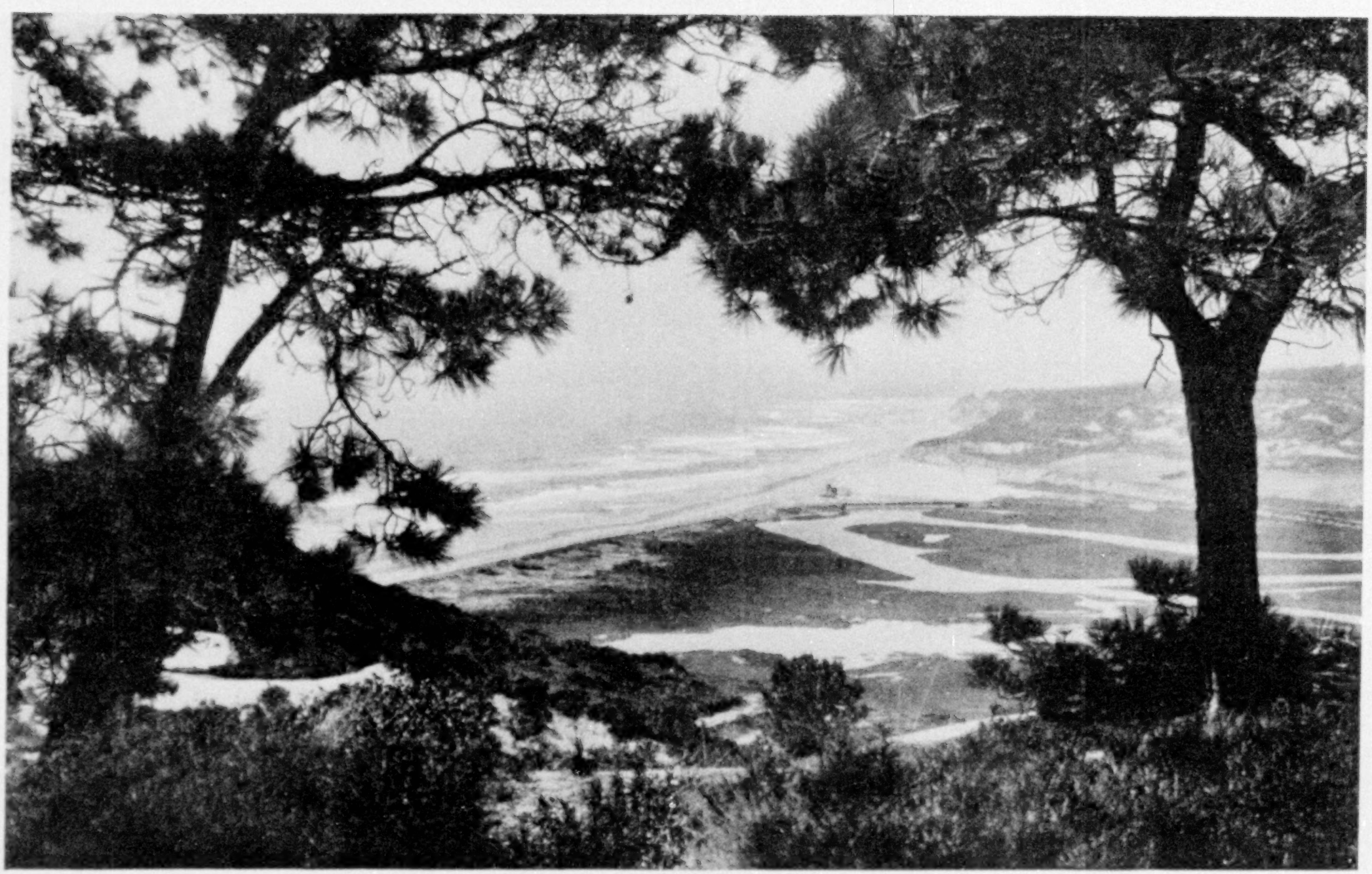
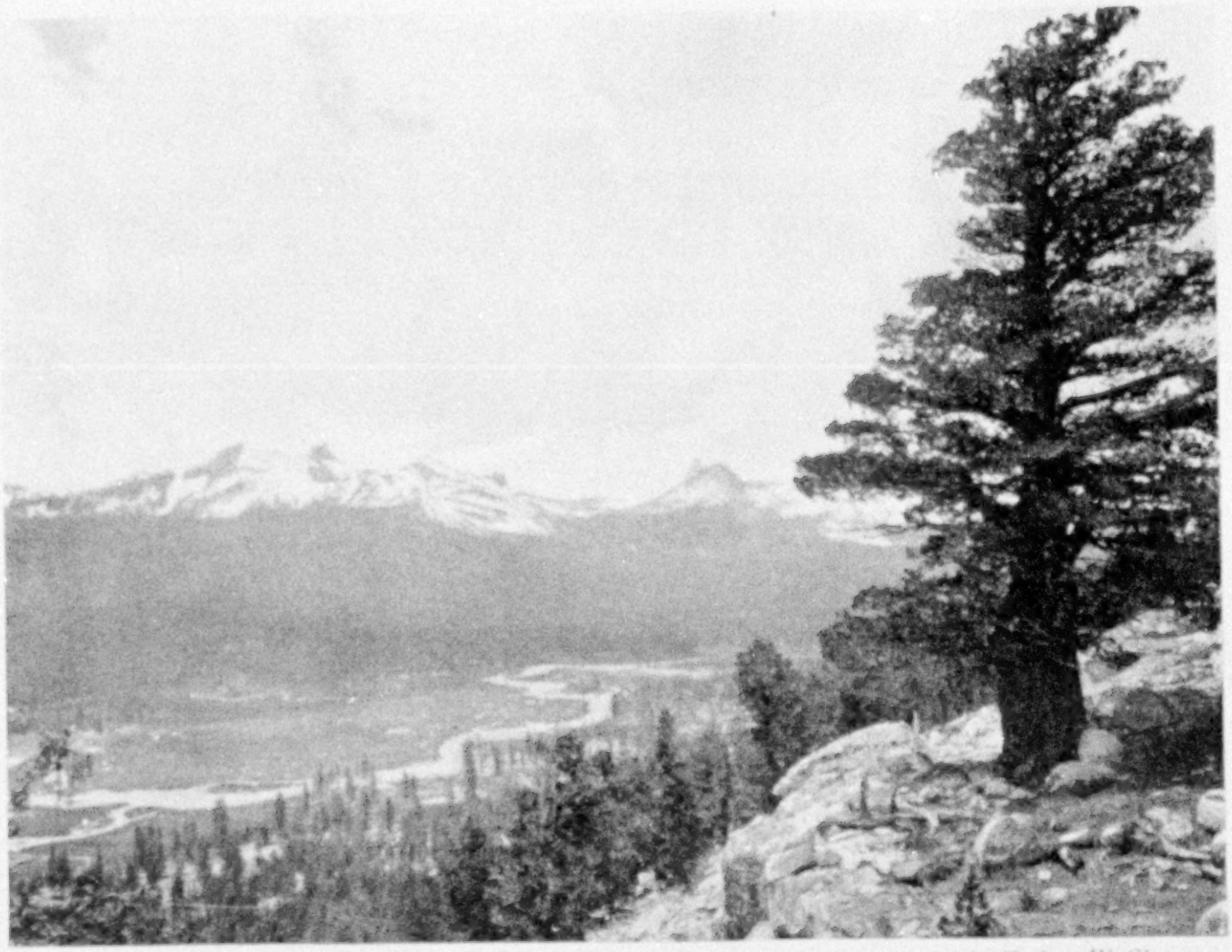


TORREY PINES FRAME THIS CALIFORNIA LANDSCAPE

This tree (*Pinus Torreyana*) is said to be found in but two places in the world—here and on Santa Rosa Island. The scene is on the Coast Route, State highway, near San Diego.



Photograph by Herbert W. Gleason

TUOLUMNE MEADOWS, FROM JUNIPER CREST, YOSEMITE NATIONAL PARK

"The widest, smoothest, most serenely spacious, and in every way the most delightful summer pleasure park in all the High Sierra."—JOHN MUIR.

level 3,000 to 4,000 feet, the highest top (in North Carolina) rising to 6,711 feet (see page 358).

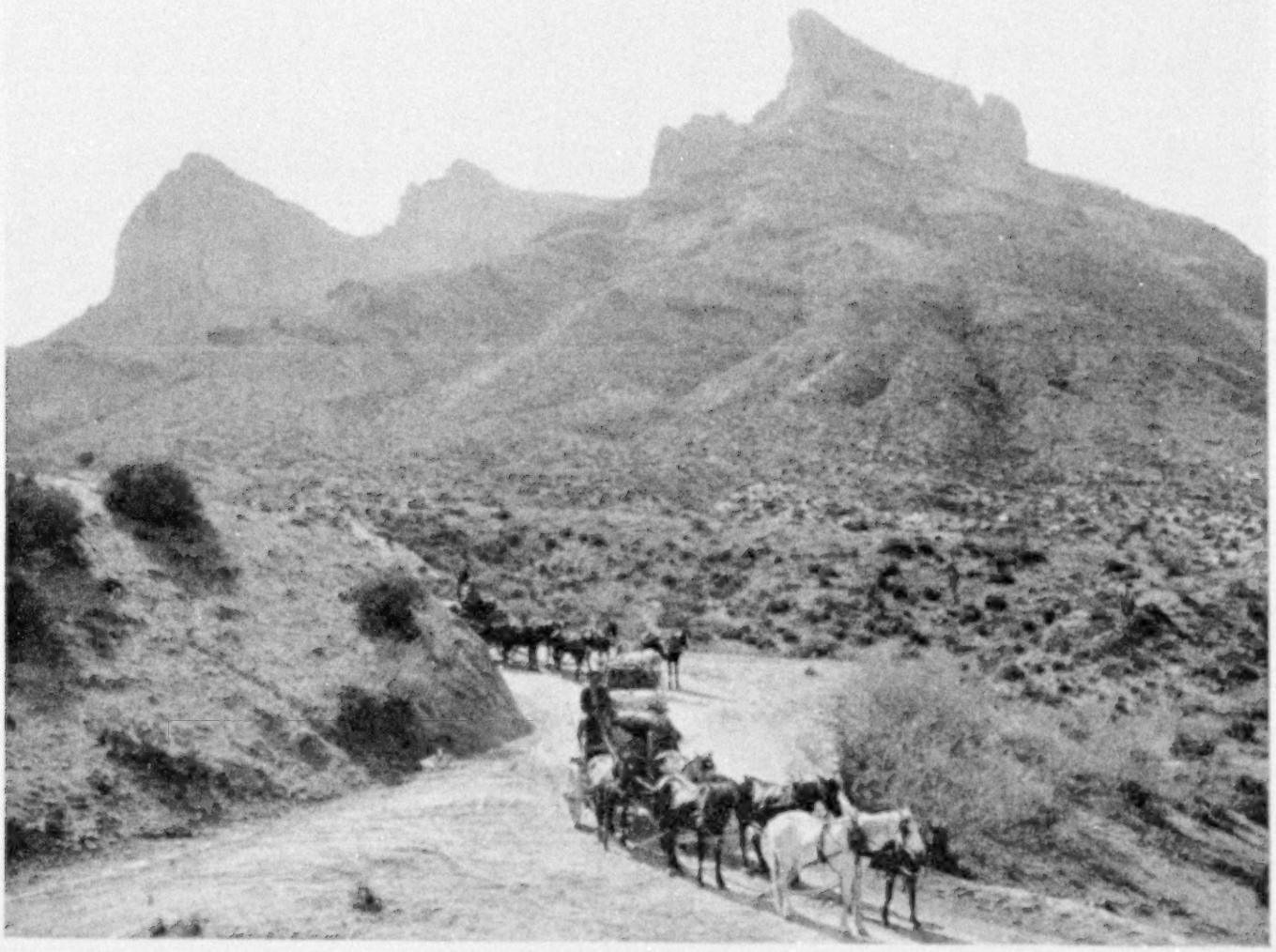
The valleys between them are usually some miles wide and all of the valley bottoms, as well as the slopes that are not under cultivation or pasture, are covered with dense wood. Here and there a long line of limestone crags runs along the mountain side for miles, its gray or bluish hue showing well against the rich woods above or below.

There are not many outstanding summits, for the ridges usually maintain the same level for many miles, so that the wayfarer might, if trails were cut along the ridge tops where the ridges are not above the timber-line, walk or ride for long distances with little ascent or descent, looking down upon the country on each side.

The lines are soft, and the scenery might be called monotonous were it not for the beauty of the forests, in which there is much variety, for in some places evergreen conifers clothe the higher slopes, while deciduous trees predominate below, prominent among them the tulip tree, with its tall, straight trunk rising like a stately column, sometimes for 60 or 80 feet to the point where it begins to throw out branches.

The superb colors which these woods take in October are chiefly due to the scarlet maples, mingled with the yellow tulips. In June the rhododendrons, abundant in many districts on the upper slopes, provide a mass of pink and purple glow comparable to that which their Himalayan sisters give to the traveler in Sikkim or Nepal.

There are no lakes and the streams, rippling or murmuring along channels mostly embowered in wood, play no great part in the landscape, though now and then, as along the course of the river



Photograph from E. O. McCormick

A JAGGED SKYLINE NEAR FISH CREEK, ARIZONA

called French Broad, in North Carolina and East Tennessee, they break into a series of picturesque rapids.

MOUNTAIN MASSES OF NEW ENGLAND DIFFER FROM THE ALLEGHENIES

The Appalachian mountain masses of New York and the New England States are quite unlike the Alleghenies in their scenic character. There is hardly any limestone. The rocks are mostly gneiss or granite or slates and mica schists, very old and very hard.

The aspect of the heights is rougher and sterner and the timber-line lower, so that the ground above 4,000 feet is usually open and bare, while above 5,000 feet it is often covered by loose rocks, decomposing under the storms of spring and fall. Yet the hardness of the rocks gives few striking forms and the slopes are seldom precipitous, for this whole region has been worn down by the huge glaciers which formerly covered it, rounding off the protuberances and carving out the valleys.

Mount Washington, the highest point, and its fellow-summits of the so-called "Presidential Range" in New Hampshire are huge masses, breaking down steeply here and there into glens and into those deep semicircular hollows which the Scottish Highlanders call "corries," but rarely showing either a prominent peak or an imposing precipice.

It is only in such precipices as these are that the rock-climber finds his chance, for there are no spiry pinnacles or narrow arêtes to test his powers of clinging to a smooth and narrowing pillar of granite or of executing a sort of tight-rope "stunt" by creeping along a knife edge of rock. Neither are there deep and narrow gorges like the canyons of Colorado and Utah.

A QUIET BEAUTY IN THE VALLEYS OF NEW ENGLAND

But the valleys have a quiet beauty into which one joyfully descends from the rugged stone-strewn wastes above. It would be hard to find anywhere a lovelier

Photograph © Herbert W. Pelton

VANISHING STORM-CLOUDS VIEWED FROM MOUNT MITCHELL, NORTH CAROLINA

With an elevation of 6,711 feet, Mount Mitchell (also called Black Dome) is the highest peak in the United States east of the Rocky Mountains (see text, page 356). Professor Elisha Mitchell, for whom the mountain is named, lost his life while determining its height in 1857. He is buried on the summit

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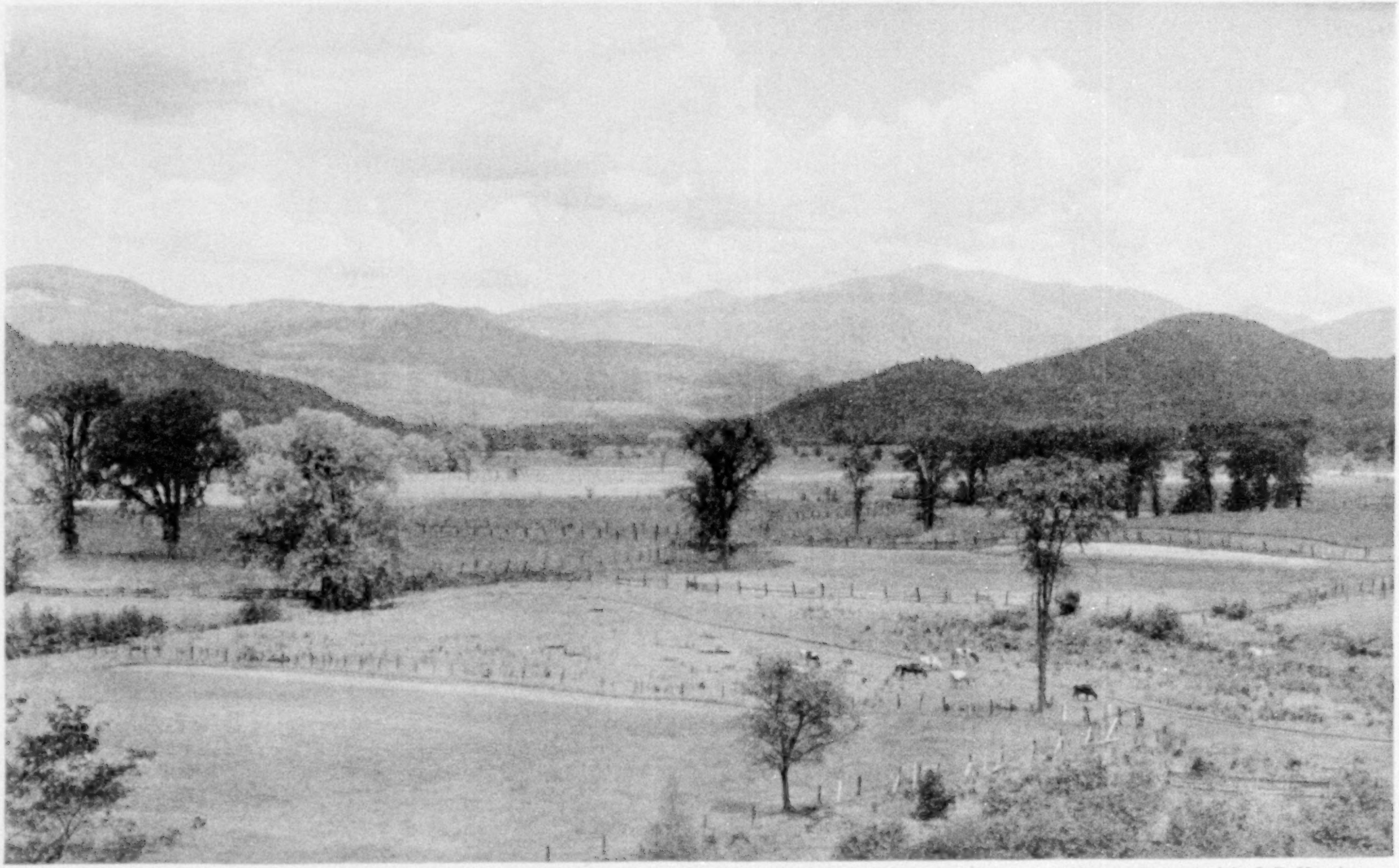


Photograph by J. D. Hunting

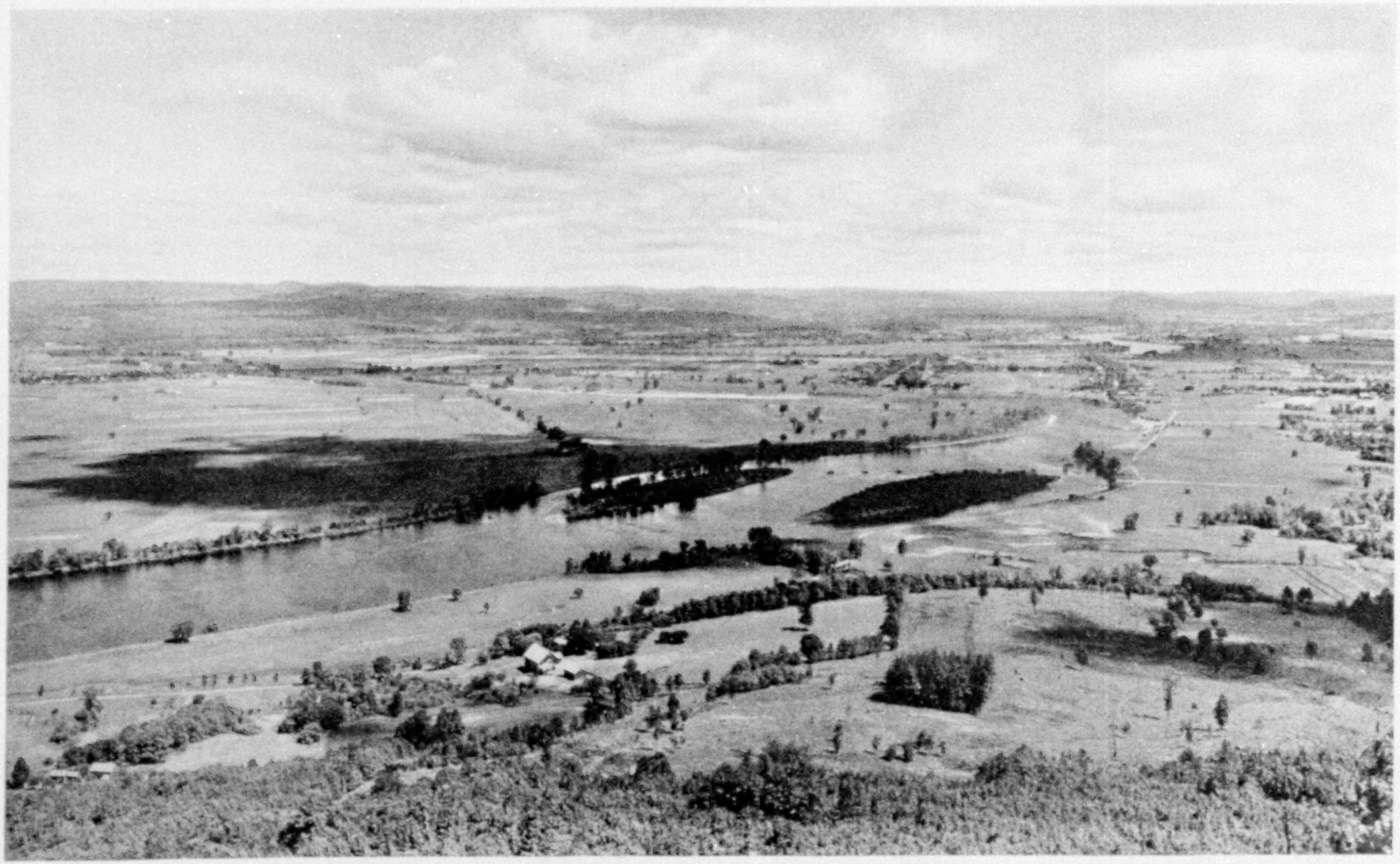
THE UNDULATING LINE OF THE WHITE MOUNTAINS FROM INTERVALE, NEW HAMPSHIRE

"It would be hard to find anywhere a lovelier landscape, in quiet style, not thrilling, but sweet and soothing, than that of Intervale, above North Conway, in New Hampshire" (see text, page 366).

Photograph by Kalkhoff Company

MOOSEHEAD LAKE, MAINE, FROM MOUNT KINEO

The lakes of New England and of northern New York are among the chief scenic charms of eastern North America.



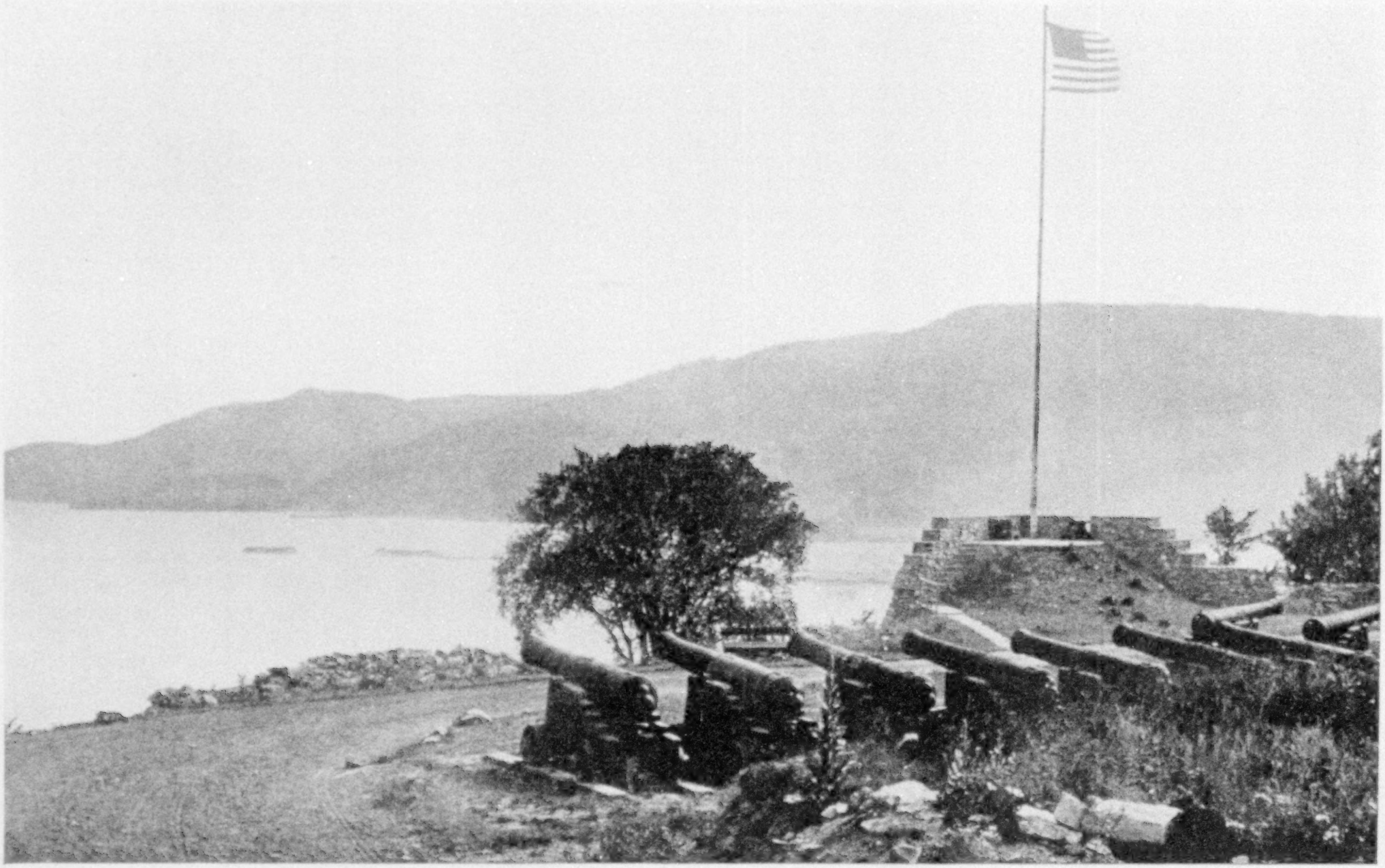
THE PEACEFUL VALLEY OF THE CONNECTICUT VIEWED FROM MOUNT HOLYOKE

"The valleys have a quiet beauty into which one joyfully descends from the rugged stone-strewn wastes of the Presidential Range" (see text, page 357).

Photograph by United States Army Air Service

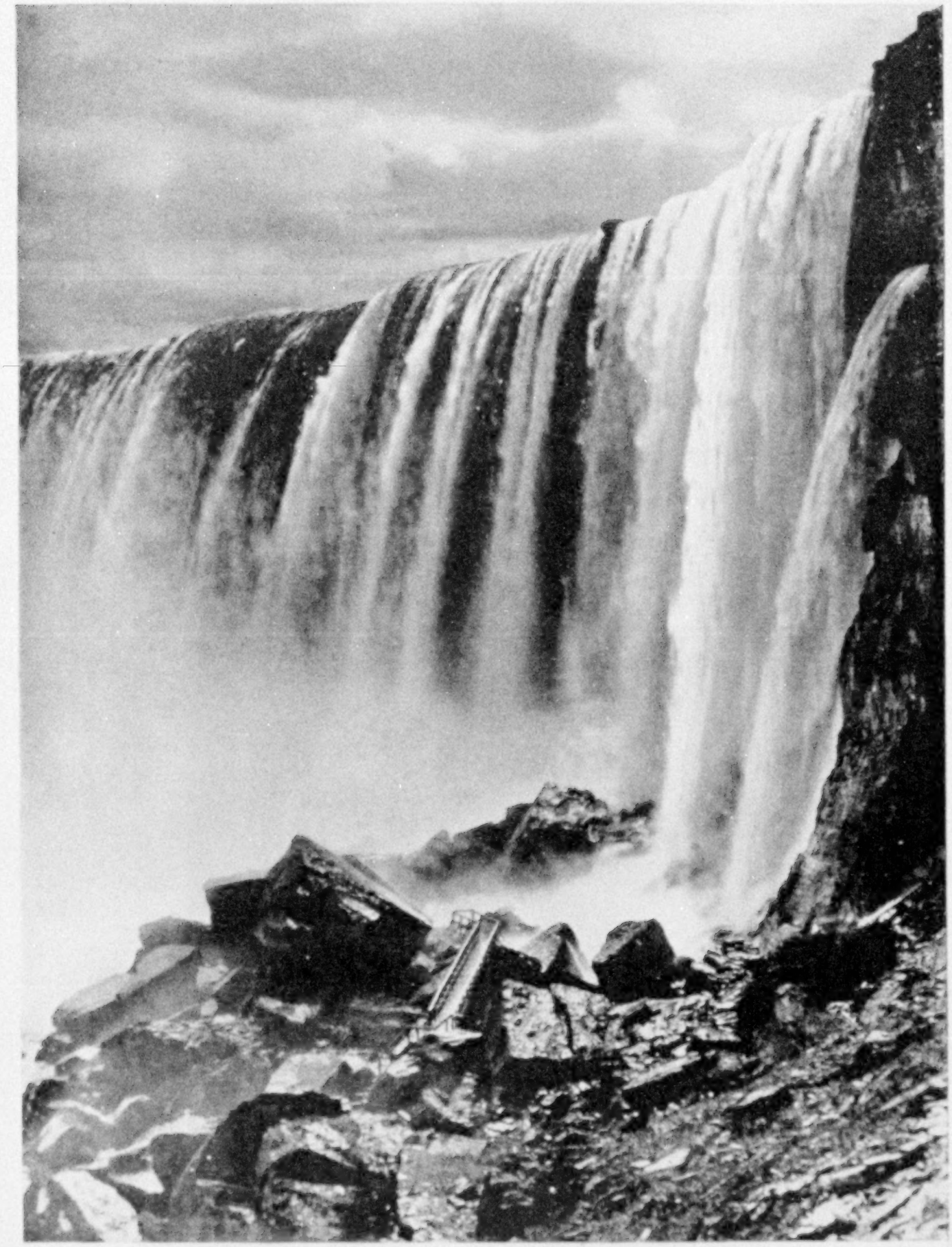
AN AIRPLANE VIEW OF THE UNITED STATES NAVAL ACADEMY, ANNAPOLIS, MARYLAND

Charmingly situated near the mouth of the River Severn, the capital of Maryland has one of the most picturesque locations of the middle Atlantic seaboard.



THE PARAPET OF FORT TICONDEROGA, OVERLOOKING LAKE CHAMPLAIN

"Lake Champlain is a noble sheet of water, as seen from the hills of Vermont, with the Adirondack peaks rising behind it" (see text, page 341).



Photograph by Ernest Fox

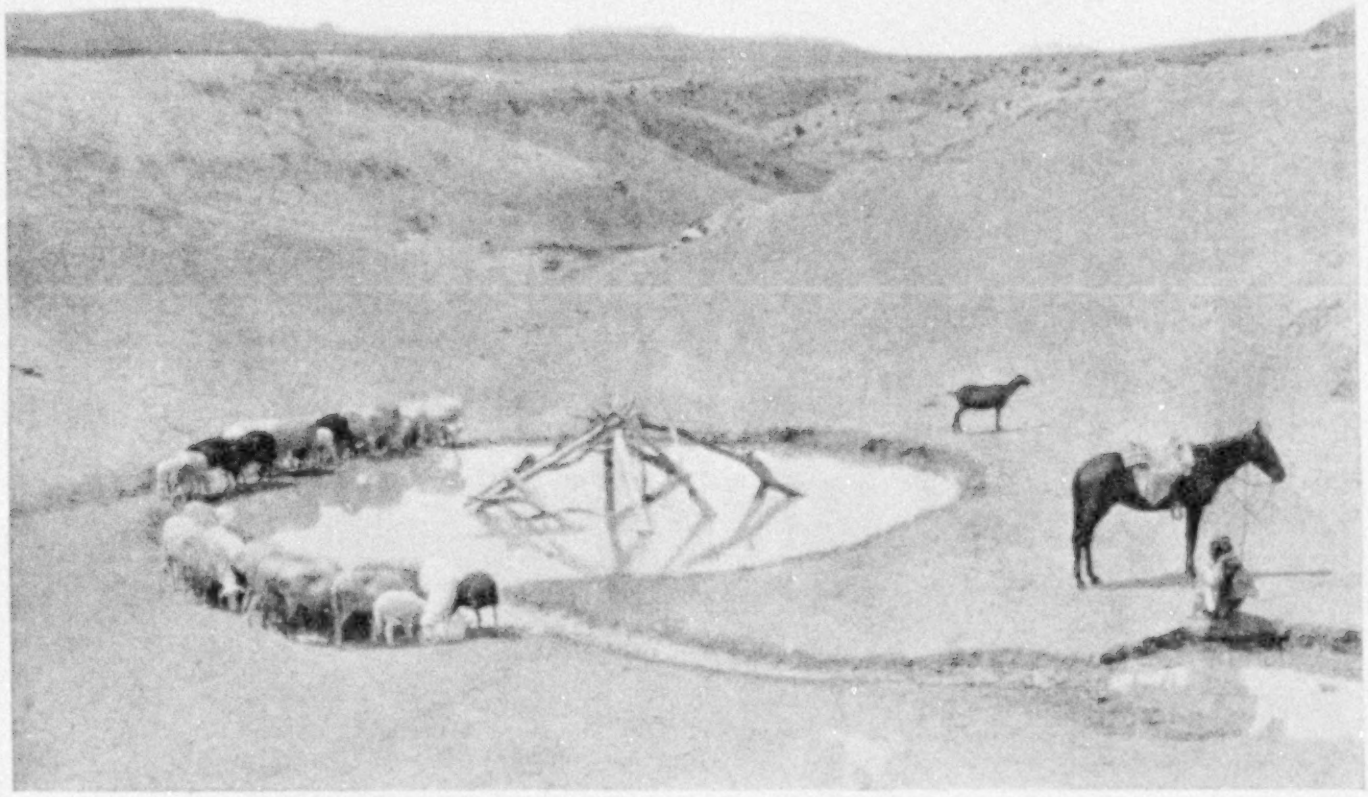
THE HORSESHOE FALLS OF NIAGARA IN SUMMER

Since American pioneers first gazed in wonder and admiration upon these falls, the greater cataracts of the Zambezi, in South Africa, and those of Kaieteur and Iguazu, in South America, have been discovered, but Niagara remains one of the scenic marvels of the natural world.

Photograph International Film Service

WHEN WINTER CRYSTALLIZES NIAGARA'S MISTS

While Viscount Bryce deplores the diversion of some of the waters of Niagara to utilitarian uses (see text, page 369), the mighty cataract is still the pride of our North American scenery east of the Rockies. When the waters are frozen and huge hillocks of ice cover rocks and river, it is even more impressive than in summer.



Photograph by C. Wharton James

A DESERT WATER-HOLE IN ARIZONA

landscape, in a quiet style, not thrilling, but sweet and soothing, than that of Intervale above North Conway (in New Hampshire), near which, under the bold ridge of Chocorua, the honored and beloved philosopher, William James, used to spend his summers (see page 359).

The lines of the hills descending one behind another, fainter and fainter as they recede into the level dale through whose meadows a clear stream meanders, blue or dark gray rock falls showing here and there through the thick hillside woods, clusters of houses giving a human touch to the scene, and in the far distance the snow-tipped top of Mount Washington—these make up an unforgettable picture.

Prospects of like character recur every few miles as one journeys northward up the long stretch of the Connecticut River Valley between New Hampshire and Vermont (see pages 359 and 361); nor are they wanting among the wooded hills of western Massachusetts.

The visitor from northern or central Europe is surprised to find that he cannot roam at will over these hills, not that any game preservers stop him, but because there is little open grassy land upon the middle and higher slopes, only thick woods untraversible except by the few trails. The wood is seldom cut except where it is easy to drag or float to a railroad, so high is the cost of labor.

SUMMER CAMPERS FROM THE CITY FREQUENT NEW ENGLAND GLENS

Thus upland pastures, enlivened by the cattle and chalets, such as those which delight us in the Alps and Pyrenees and Jura and the German Schwartzwald, are wanting. Here and there one comes on a farm deserted by a family which has gone West, the barn falling to pieces, but the orchard still bearing apples which no one comes up to gather; it is only the summer campers from the cities that wander up the glens and on to the bare, windswept heights.

A wide view is always interesting and suggestive, but the prospects from these mountain tops want the variety of those the climber enjoys in Scotland and Wales and in the hill regions of central Europe. Here the eye ranges over a vast expanse of high country, mostly either bare and

Photograph by George H. Harvey, Jr.

CROSSING THE GREAT DIVIDE IN MIDSUMMER

The snow lies deep at the end of June on Flattop Mountain, one of the peaks in the Rocky Mountain National Park, Colorado.

rocky above 2,500 feet or thickly wooded lower down, with scarce any upstanding peaks to fix the eye.

It is rather in the valleys that the characteristic charm of New England scenery is to be found. The villages are pretty, despite the unlovely frame houses, for they are surrounded by elms, more graceful with their pendent boughs than are the elms of England, and the stately maples line the streets and lanes. Every house has its wide, well-kept grass plot, open to street or road, and the whole village seems to swim in verdure.

The lakes of New England and northern New York must not be forgotten, for some of them, like Moosehead Lake in Maine, have a wild, and others, like Lake George and the Saranacs, a soft and placid beauty. But none of them, not even Lake Champlain, can be ranked with the lakes of Switzerland and Austria, still less with those of North Italy—Maggiore, Como, and Garda.

I have left to the last the supreme charm of East American scenery. It is a charm to be enjoyed only during six weeks in the year, from the beginning of October to the middle of November, during the "Indian Summer," a season scarcely known to Europe except in middle Italy and Greece.

A WEALTH OF COLOR IN THE WOODS

The later part of the fall gives to the woods a wealth of brilliant color nowhere to be found in the Old World, unless perhaps in Korea and Japan. It is chiefly in the maples that these colors are found, for they turn to superb crimsons and scarlets, but they are seconded by the many-tinted yellows of beech and birch, while white pines, interspersed among the deciduous trees, with their deep yet tender green, less dark than that of the Scotch fir, present a contrast against which the maples glow all the more vivid.

The loveliest hues of English woodlands in May, such as one sees there in the valleys of the Wye, hues more delicate than those of autumn, make no such impressions of Nature's resources as do

Photograph by J. Smeaton Chase

AMERICA'S SAHARA, THE COLORADO DESERT, WITH MOUNT SAN JACINTO (10,805 FEET) IN THE DISTANCE

"The American deserts are adorned with some noble, isolated mountain groups besides the masses of the Rockies and the Sierra Nevada which bound them on the east and west."

the forests of eastern America. To see these colors anywhere between Carolina and Canada, but best perhaps among the lakes of Maine, is worth a voyage across the Atlantic. The hillsides seem ablaze with them, a piece of Nature's most exquisite handiwork, yet they are not violent or crude, no more than is the finest Cashmere shawl or Persian rug.

These beauties are in no danger, like so much of the world's beauty, of perishing at the hands of man, for the woods have not sufficient economic value, at least where they are far from a railroad, to render it profitable to turn timber into lumber.

THE COAST LANDSCAPES OF AMERICA

The scenery of sea coasts makes so large a part of what the American visitor finds to attract him in Ireland, Scotland, and Norway that a passing word ought to be given to the coast landscapes of America (see page 384).

The Atlantic shores are low for thousands of miles, all the way from New York to the Mexican frontier, and may be left out of account, though there are pretty bits among the "keys" on the coast of Florida. It is therefore only the New England coast from Long Island Sound to the Bay of Fundy that comes into the sort of inventory I am trying to make of the scenic wealth of the continent.

Most of this northeastern coast is well known. Newport and Cape Cod and the north shore of Massachusetts Bay and the "Islets of the Pointed Firs" that fringe the deeply indented shores of Maine are too familiar to need description, and no one who has ever looked out from the highest hills in Mount Desert Island on the wonderful sea and landscape of "promontory, creek, and bay," with its winding channels and rockbound isles, can ever forget its enchanting variety.

NIAGARA NEEDS NO WORD

Neither need Niagara be spoken of. Fifty years ago it was the great natural wonder of America which every European traveler made it his first pleasure to see. Since then the falls of the Zambezi, in South Africa, and the falls of the upper Paraná (Iguazu), in South America, the former higher and the latter wider than Niagara, have become well known, and in the United States the Yellowstone Geysers and Grand Canyon of the Colorado River vie with it as marvels of Nature.

Moreover, another thing has happened: Niagara has suffered at the hand of man. An unlovely suburb of the town has grown up on the American shore, and the cliff on that side is defaced by small spouts of water spurting out from holes pierced in the rock connected with the channel constructed for the power plant.

Worst of all, the flow of water over the two great falls has been diminished, and is now distinctly thinner in the American fall than it was in 1870. One who remembers the scene as it was in that year sees it now with a sense of sad regret. One wishes that it had been possible to preserve so exquisite a picture as the banks clothed with natural wood, the majestic torrent of bright green water, bright and clear as crystal, pouring over the precipice into the seething whirlpools beneath, as presented to the first explorers (see pages 364 and 365).

Whether the gain to the companies that have developed the electric power and to the Canadian communities that have utilized it for electric railways, doubtless to the convenience of the public, has been worth the loss of much of the delight which the falls gave to the two nations, is a question not to be examined here.

AMERICAN DESERTS SURPASS IN BEAUTY THOSE OF AFRICA

It remains to speak of one other feature, and that not the least remarkable, of North American scenery—the Great Deserts. They fill parts of the States of California, Colorado, New Mexico, Wyoming and Idaho, most of Utah, nearly all of Arizona and Nevada, in the last of which the population is less than one inhabitant to the square mile and is not likely to increase unless new mines of silver or copper are discovered (see pages 366, 368, 372, 381, and 386).

The American deserts are more beautiful than those which I have seen in North Africa or North Arabia (except, indeed, in the Sinai Peninsula) or in South Africa or western South America or Ice-

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land. Of the Mongolian and Australian deserts I know only the fringes.

The wildernesses which a number of my readers are most likely to have seen are those between which lies that long, narrow, winding strip of cultivated land which the Nile redeems from aridity and which Virgil calls Green Egypt. To the west of Egypt the Libyan desert, a part of the Sahara, is generally, like that behind Tripoli, flat, with low rocky hills here and there and (except at sunrise and sunset) a dull and dreary stretch of brown.

But the American deserts are adorned by some noble isolated mountain groups besides the masses of the Rockies and the Sierra Nevada which bound them on the east and west. Such are the St. Francis Mountains in northern Arizona, clothed with snow for a large part of the year.

Such, further to the south, are some bold, sharp groups of peaks along the line of the Southern Pacific Railway. These heights, mostly standing detached and visible at long distances in the extraordinarily dry, clear air, give a striking impression of desolation and remoteness. They seem out of all relation to the life and work of man.

Here even a hermit could not support life in a cave. No water, no reverent admirer to bring him food, as the ascetic Buddhist walled up in a crevice of the rock is fed by the offerings of the pious. These mountain forms are almost terrible in their hard blaze of sunlight that sharpens their outlines.

THE SECRET OF THE CHARM OF DESERT SCENERY

But the peculiar charm of the desert, scarcely appreciable by those who have not seen it, lies in the combination with barrenness and the sense of lonely immensity which the wide range of vision gives, the most tender and delicate tints of color. In Arizona especially the varieties of rock and the inequalities of surface, scattering patches of light and shadow over the expanse, give corresponding varieties of hue, so there is no monotony, not even at high noon, when other deserts have a uniform glare, be their surface black or brown or gray.

But it is when the sun dips toward the horizon that the magic of light has its most perfect work, bringing out a whole range of tints vivid, yet delicate, for which we have no names, for they pass by faint gradations from pink to crimson and crimson to purple and purple to violet.

Every stone seems to glow like a jewel before it dies into darkness as the sun departs, while the distant violets of a limestone cliff turn to the gray of twilight. Night falls. There are no small birds to twitter, no owls to hoot; but the melancholy cry of the small desert wolf (the coyote) is heard through the silence.

TWO UNFORGETTABLE DESERT VIEWS

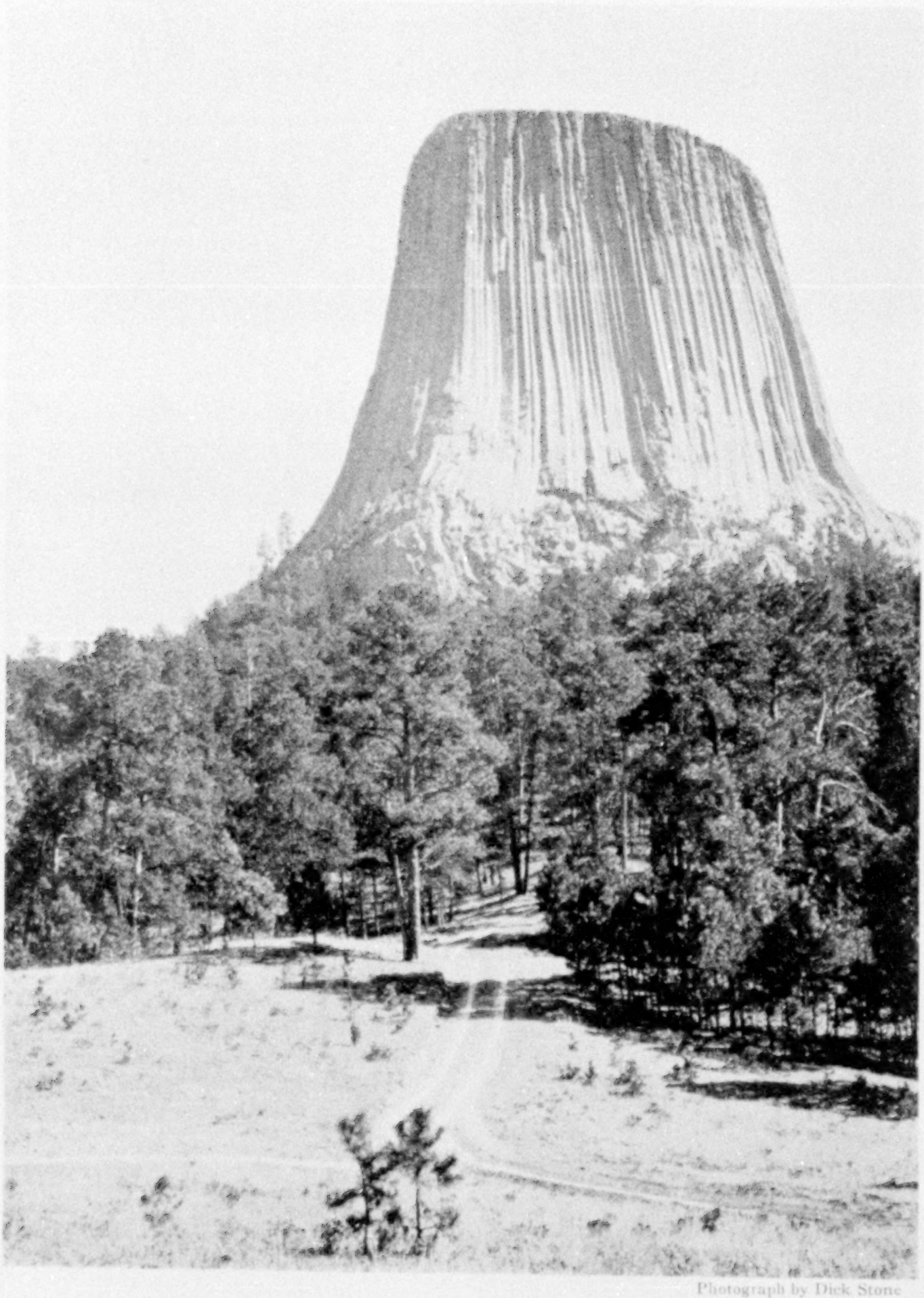
Two desert views rise to my memory as splendid in their amplitude. One is that from the hill behind Salt Lake City, where there used to be—perhaps is still—a military post. In the foreground beneath is the city, its suburbs so well planted as to seem encircled by and embowered in trees, though trees grow only by the help of irrigation. Beyond it, westward, are the shining levels of the Great Salt Lake, and beyond them lofty peaks, with desert valleys running up between among the distant ranges that fade away, line behind line, to the north, west, and southwest.

This view, best seen in the afternoon, is worthy of the brush of Claude Lorraine or Turner.

The other prospect is that over the Painted Desert in Arizona, looking north and northeast from a point above the Grand Canyon, some twelve miles east of the railway station at the Bright Angel Trail. Here one gazes over a far-stretching plain, dotted here and there with rocky eminences and with mysterious snow-tipped mountains in the dim distance.

Dark spots of vegetation, coniferous trees that can live even in this arid land, alternate with rock faces of red and yellow, and the sense of vast space is heightened by the innumerable varieties of color. One longs to wander among the deep canyons that seam this wilderness, each with its own labyrinth of crags and tumbled rocks.

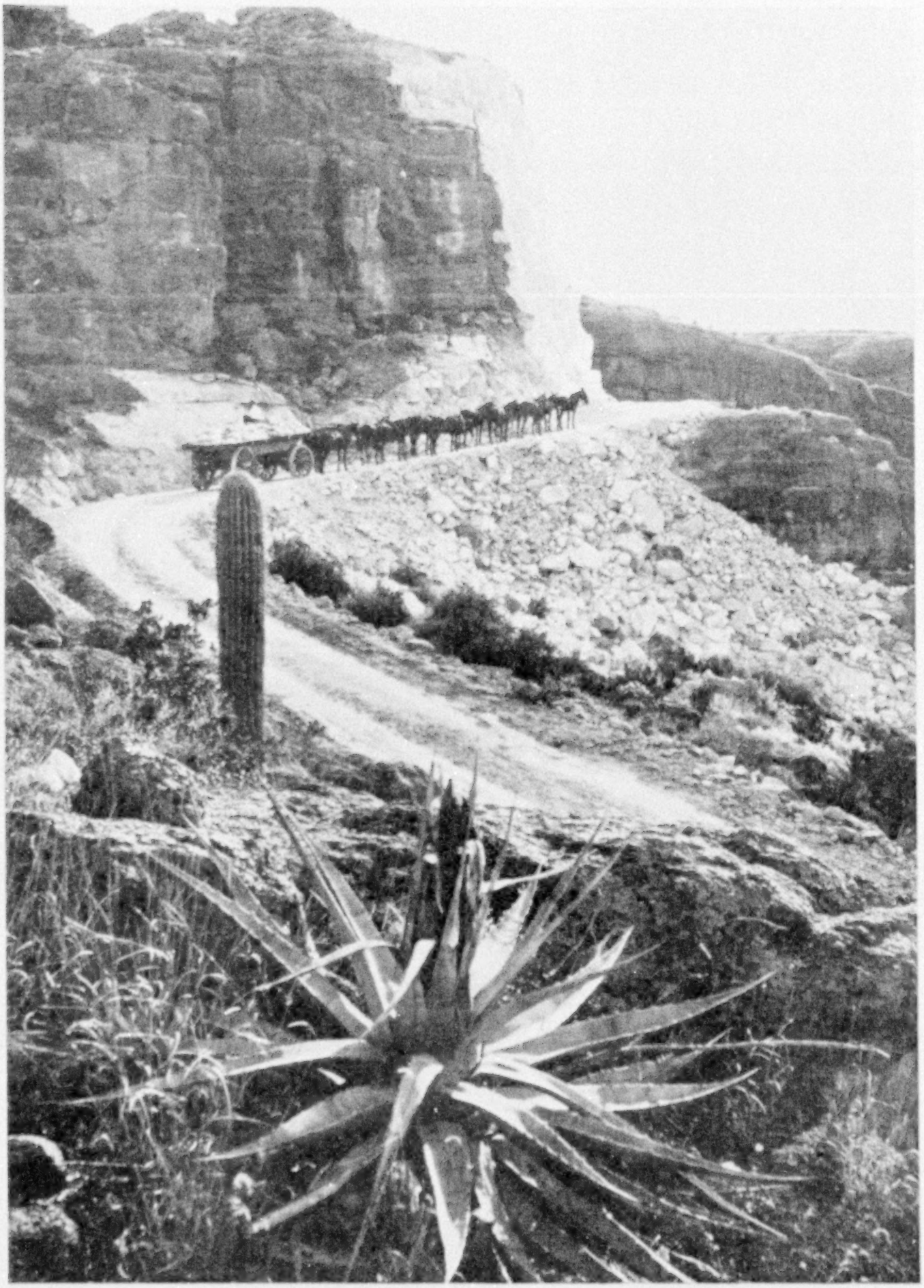
Having now reached the edge of the Grand Canyon, I must devote a few sen-



Photograph by Dick Stone

DEVILS TOWER, AMONG THE BLACK HILLS OF WYOMING

Indian legend thus accounts for this natural wonder: While gathering wild flowers, three Indian maidens encountered three bears. The girls fled to a large rock, which began to grow. As the bears climbed in pursuit, the walls rose higher and higher, until at last the beasts fell to their death, while the maidens eventually perished from hunger, being unable to descend the cliff-like walls. The marks of the bears' claws can be seen to this day on the tower! It has been set aside as a national monument.



Photograph from N. H. Darton

THE TOP OF FISH CREEK HILL, ON THE ROAD FROM PHŒNIX TO ROOSEVELT, ARIZONA

Photograph from E. O. McCormick

SPECTACULAR AMERICAN DESERT VEGETATION: A GIANT CACTUS OF ARIZONA

THE LONG, LONG TRAIL WINDING THROUGH THE MAGNIFICENT MOUNTAIN PARKS SYSTEM OF COLORADO

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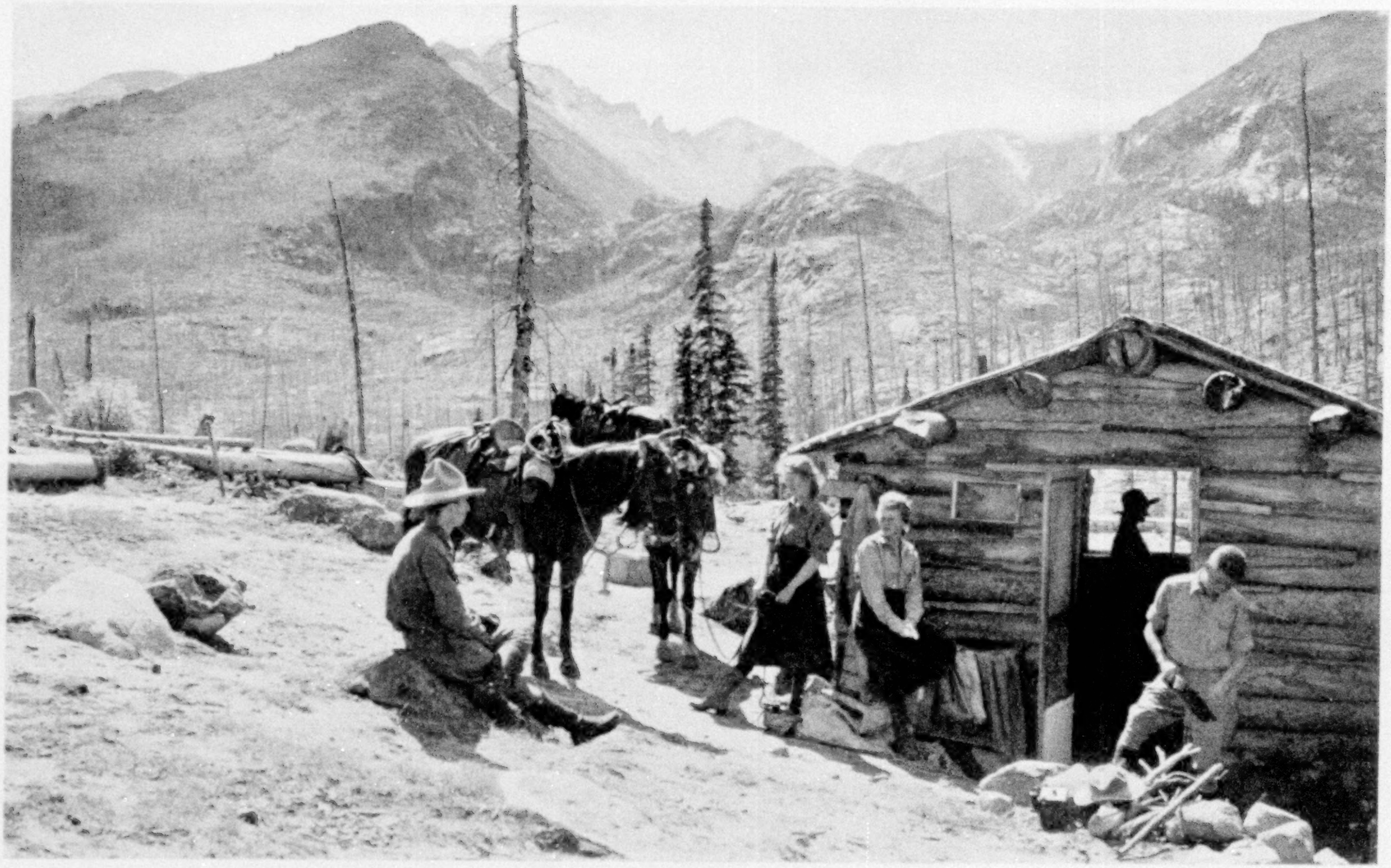
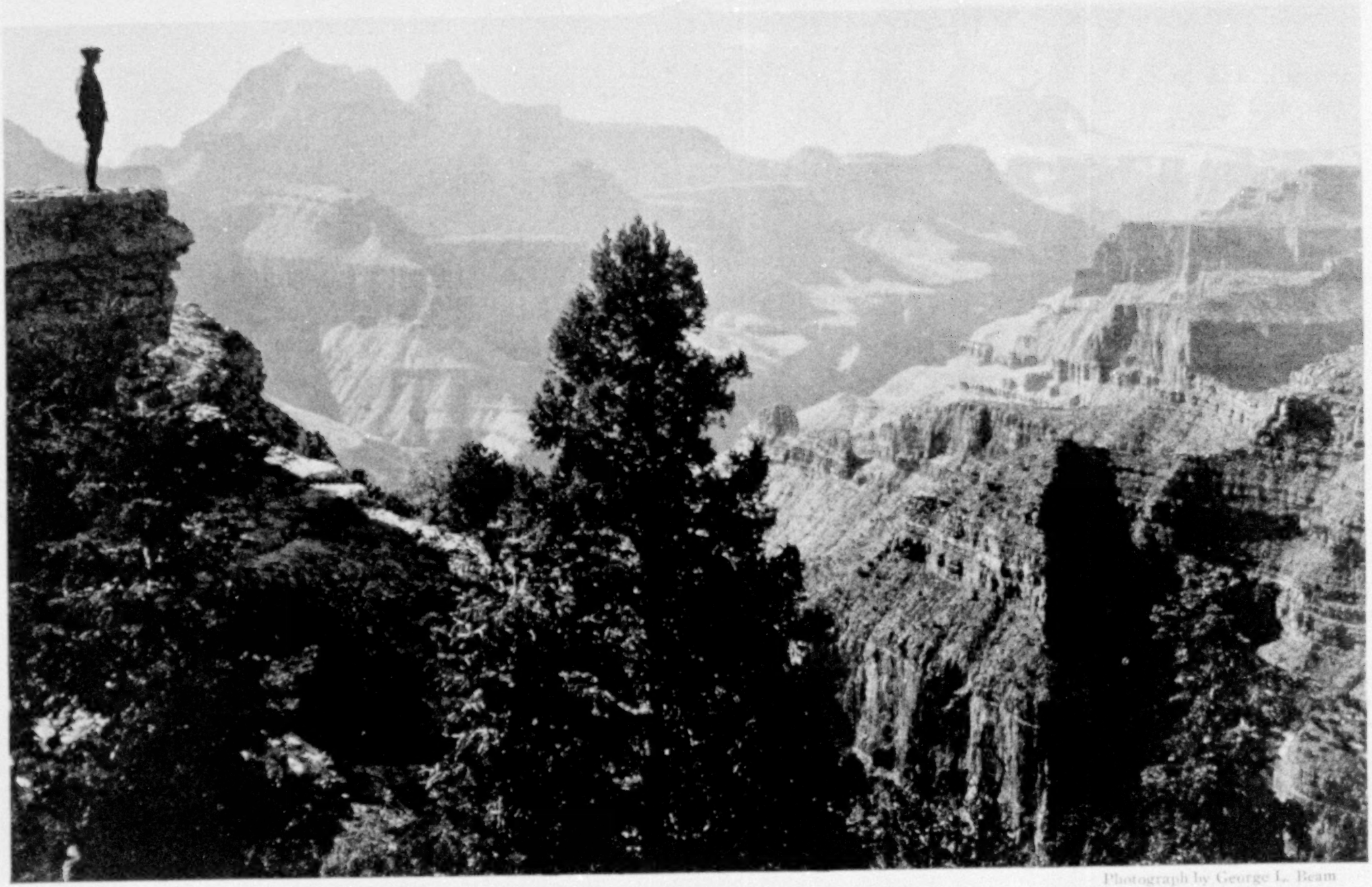


AN OUTPOST CABIN AT THE END OF ONE OF THE TRAILS IN THE BEAR LAKE REGION: ROCKY MOUNTAIN NATIONAL PARK



Photograph by George L. Beam

THE GRAND CANYON OF THE COLORADO FROM BRIGHT ANGEL POINT, NORTH RIM; GRAND CANYON NATIONAL PARK

"Such a display of rock colors, laid out like bands of blue and yellow and red on a ribbon and stretching for hundreds of miles, is seen nowhere else in the world" (see text, page 387).

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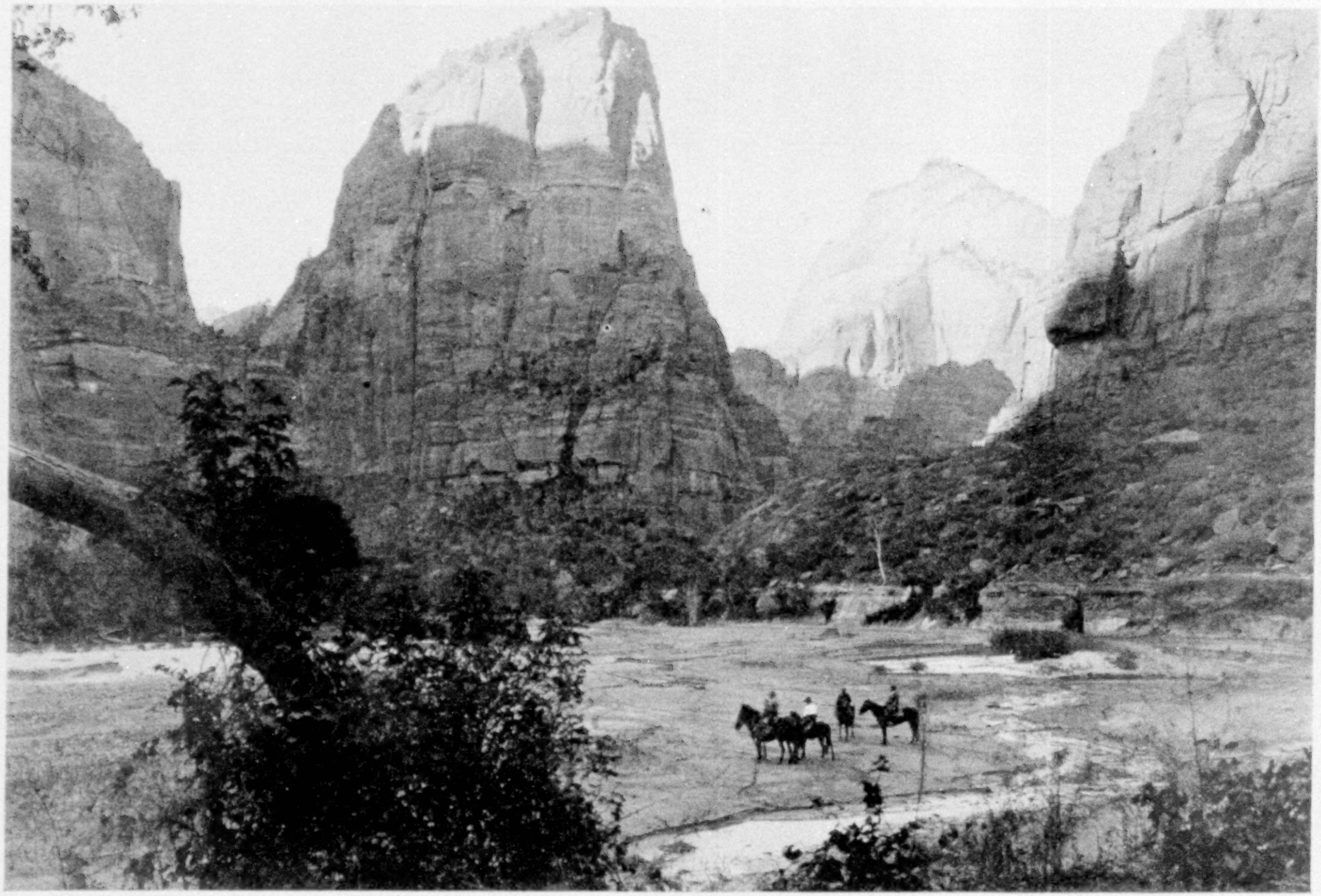

Photograph by George L. Beam

ANGEL'S LANDING IN ZION NATIONAL PARK, UTAH

Created a national park in 1919, this canyon is one of the scenic wonders of America. Most of its cliffs are of a gorgeous red hue for two-thirds of their height, the remaining third being a glistening white, while some of the white-top towers of stone are capped with crimson (see also page 382).

BOATING ON TWO MEDICINE LAKE, GLACIER NATIONAL PARK

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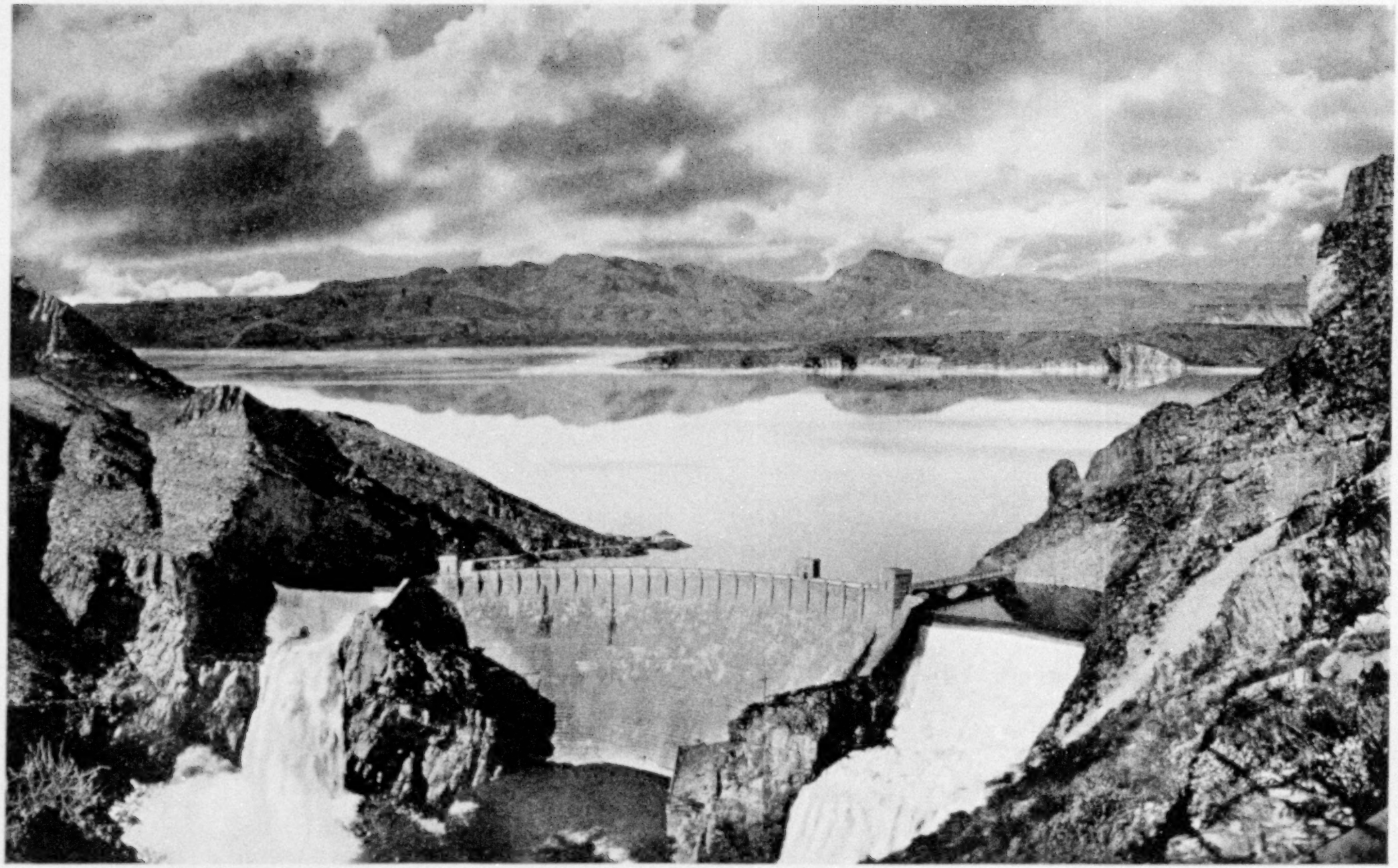


Photograph by E. O. McCormick

ROOSEVELT DAM, WHOSE WALL, 280 FEET HIGH AND 1,080 FEET LONG, IMPOUNDS THE WATERS OF SALT RIVER, ARIZONA

Photograph by Pillsbury Picture Co.

WHEN THE WHITE SHROUD OF WINTER ENVELOPS HALF DOME: YOSEMITE NATIONAL PARK (SEE ALSO ILLUSTRATIONS, PAGES 343-347)

XUM

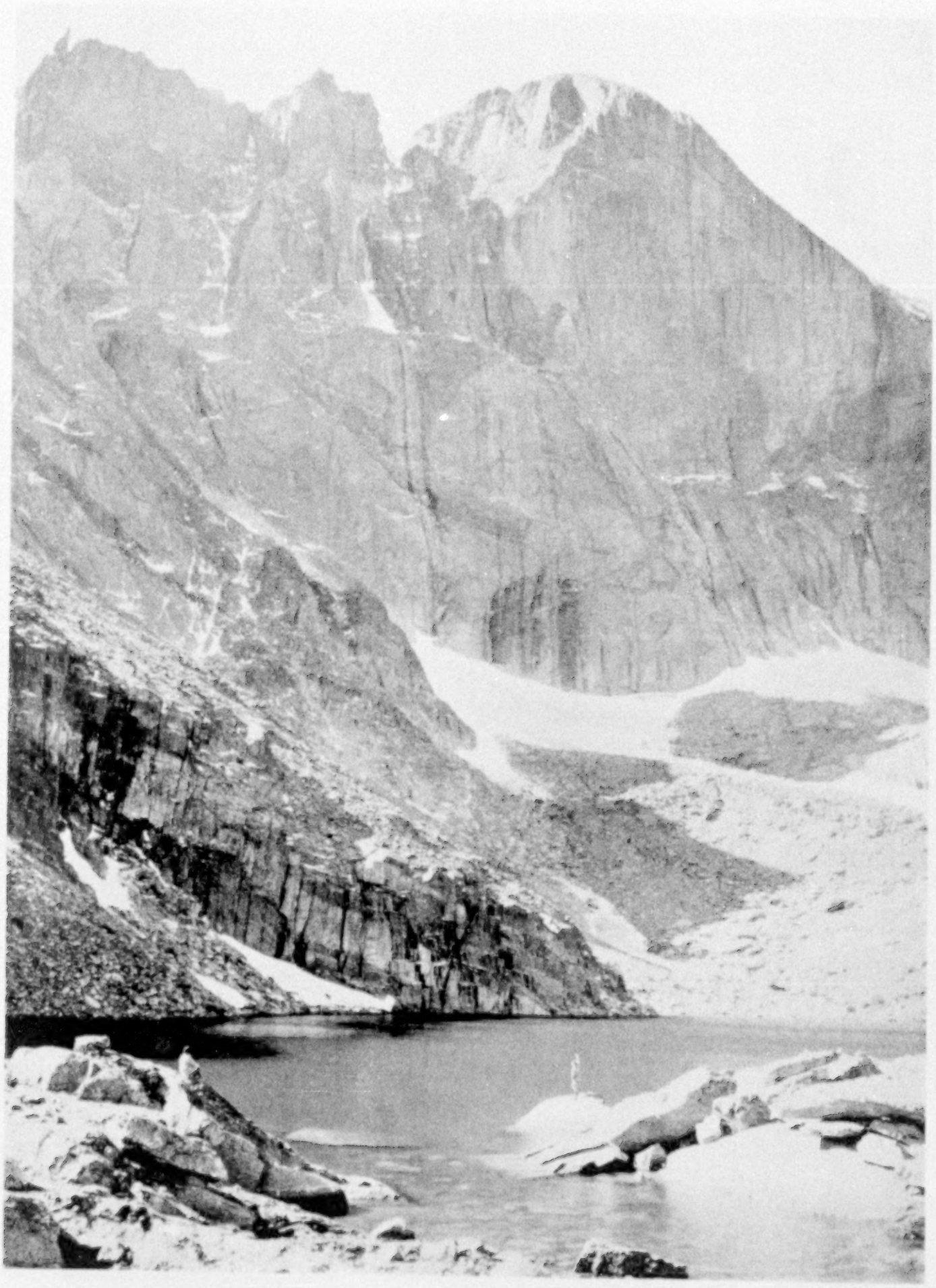
Photograph by Lloyd Cooper

EVENING PRIMROSES IN FULL BLOOM AT EASTERTIDE ON THE COLORADO DESERT (SEE ALSO PAGE 368)

Photograph by Eyre Powell

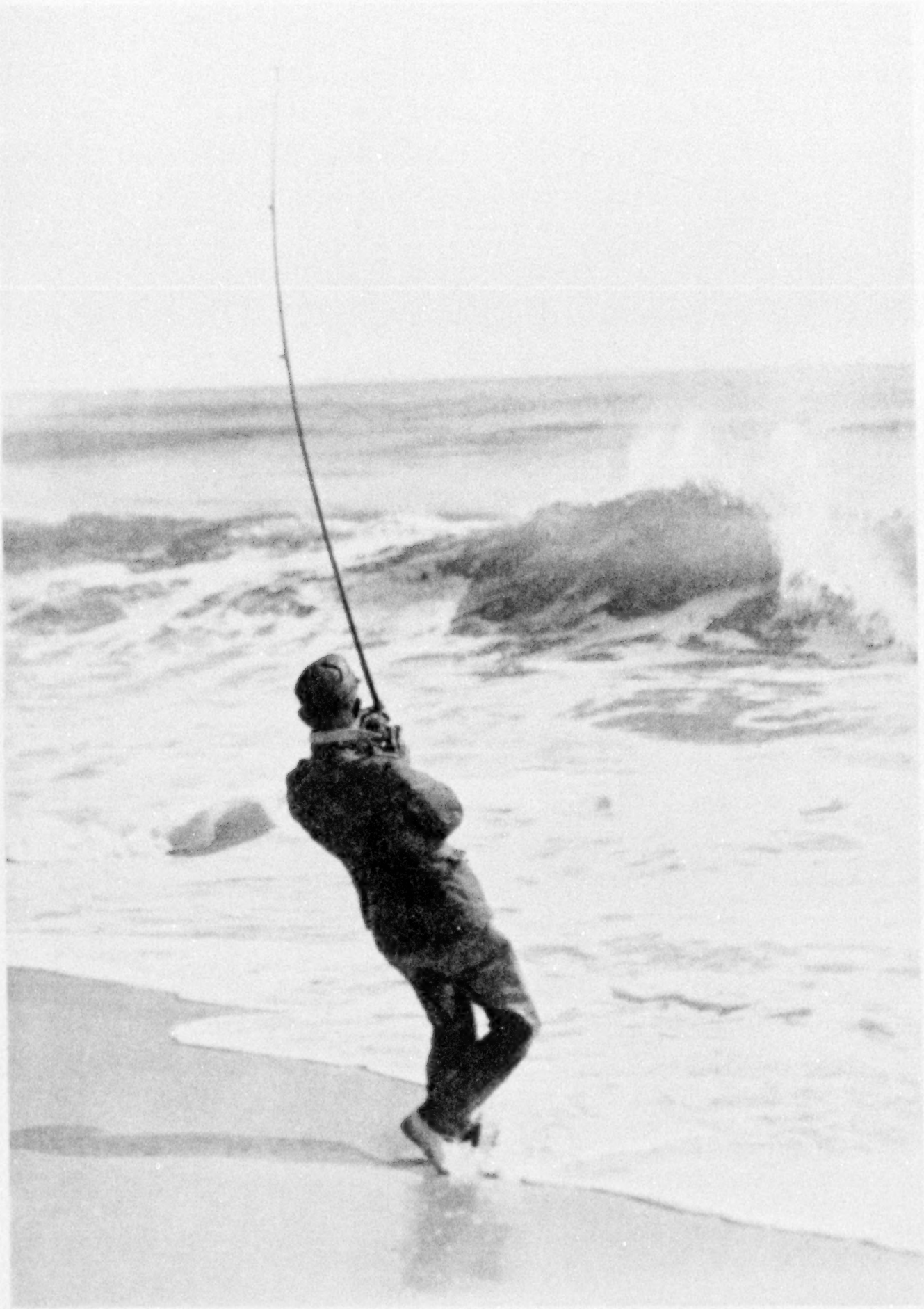
THE WET TRAIL THROUGH THE NARROWS: ZION NATIONAL PARK

The bestowal of picturesque names is a familiar practice in America's national parks, and one of the most appropriate of these is "The Rainbow of the Desert" given to Zion Canyon, whose water-carved sandstone cliffs present brilliant contrasts in color. This canyon was known to the Mormons as early as 1861, when Brigham Young recognized it as an admirable place of refuge for his sect in the event of attack (see also illustration on page 377).



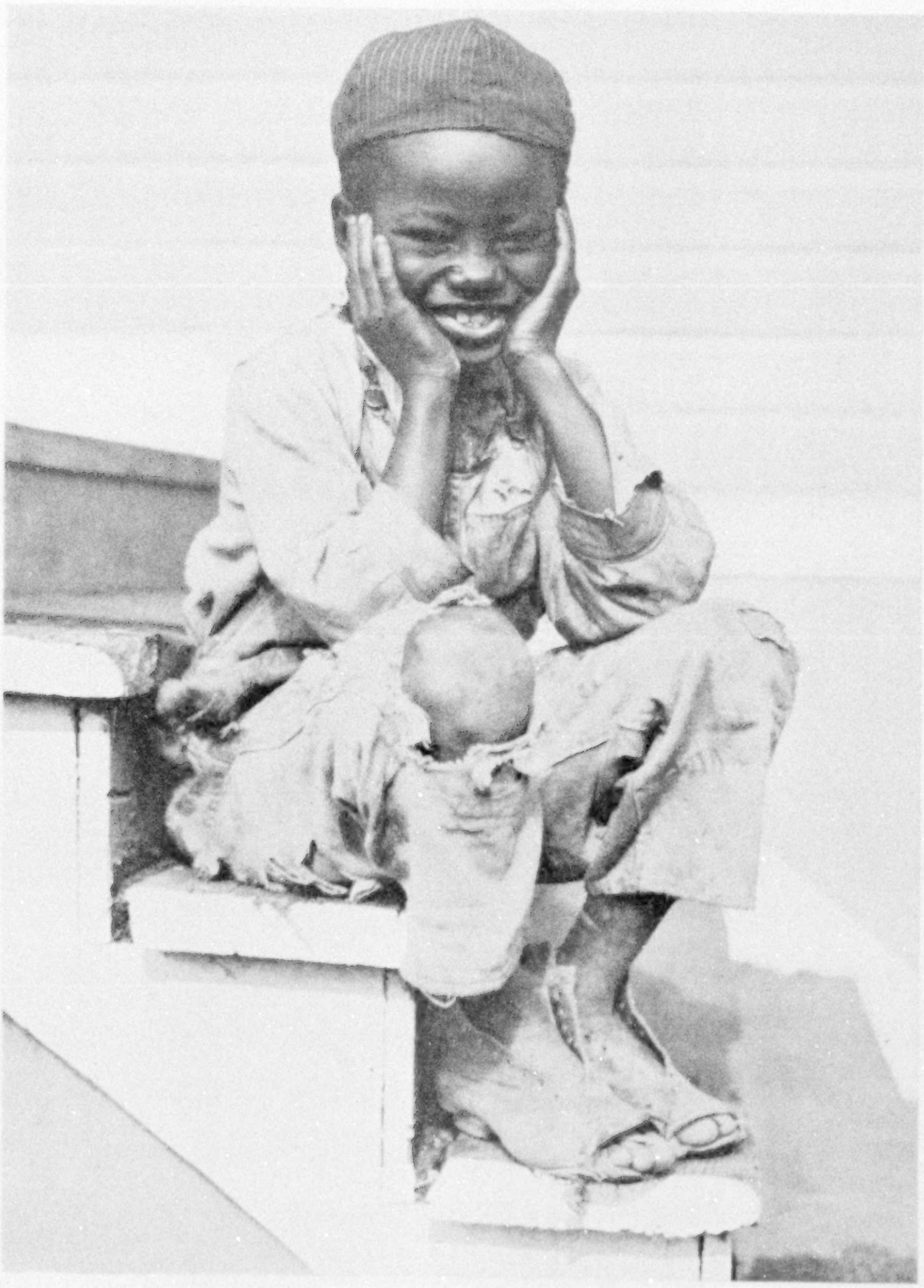
CHASM LAKE, IN THE SHADOW OF SNOW-CROWNED LONGS PEAK, COLORADO

King of Mountains is the royal title given to Longs Peak, the most striking summit of the Snowy Range, in Rocky Mountain National Park, one of the country's playgrounds which is distinguished by its profusion of glacier-watered valleys, with their luxuriant groves of white-stemmed aspens and dark-leaved pines (see also illustration on page 340).



Photograph by H. Armstrong Roberts

SURF CASTING ON THE ATLANTIC COAST



NOT A CARE IN THE WORLD!

Photograph by George Dock

ON THE DESERT TRAIL, OVER WINDSWEPT POLISHED ROCK, TO RAINBOW BRIDGE, UTAH

tences to that unique wonder of the world (see pages 350 and 376).

THE GRAND CANYON, UNIQUE WONDER OF THE WORLD

This gorge of the river Colorado, many hundreds of miles long, is most accessible at the point to which a branch railroad has been built. Here the canyon is 6,000 feet deep and about 12 miles wide from the one edge to the other of the gulf which the swift torrent has excavated, cutting its way down through successive lines of horizontal strata, sandstones, white, yellow, and red, and limestones, gray and blue.

At the bottom one finds the primeval rock, a hard, red porphyry, on which all the sandstones and limestones were deposited during the untold ages that elapsed before these strata were raised to form dry land. Thereafter began that process of cutting down through the strata which has already lasted for countless centuries and is still in progress.

Wonderful are the colors of these strata, superimposed one upon the other, and they stand strongly out, for in this dry air no mosses or lichens cling to their precipitous faces.

On each side of the main canyon comparatively short, narrow gorges have been carved out by streams when a sudden storm has flooded the plateau behind and forced the water to discharge itself into the great canyon.

Round the upper parts of these secondary canyons, which have hollowed out semicircular recesses or cirques in the line of the Grand Canyon, the horizontal strata of the Grand Canyon are continued, prolonging what we might call the decorative scheme of color up their recesses.

Such a display of rock colors laid out like bands of blue and yellow and red on a ribbon and stretching for hundreds of miles is seen nowhere else in the world, the nearest approach to it being, I have heard, in the cliffs that stand along the middle course of the Amur River, in northeastern Asia.

Why this deep hole in the ground should inspire more wonder and awe than the loftiest snow mountain or the grandest waterfall I will not attempt to explain. But it does.

One cannot leave off gazing and wondering. Beauty and grandeur enhance one another. Morning, noon, and evening the same unchanging precipices show their unchanging colors, cliffs looking across at cliffs as they have done for millions of years and will do for millions more.

One descends by a very steep and winding footpath down to the river at the bottom and ascends again, seeing all there is to see, but the spell is the same when one emerges.

The vastness and the changelessness create a sense of solemn silence. This intense silence is the most awesome thing. Why does this strange panorama produce so profound an effect? Is it because color impressions are usually the most changeful of all the impressions we receive, since color varies with atmospheric conditions, exciting rather than stilling perception and mental reactions, that the eternal steadfastness and mathematical rigidity of these colors grasp and fix and seem to hypnotize the beholder? I do not know. Anyhow, the effect is what I have tried to describe. I am giving the experience of others as well as my own.

SCENERY OF NORTH AMERICA AND OF EUROPE COMPARED

Comparing the scenery of North America with that of Europe, the first and obvious contrast is that of scale. Everything is large, and the most interesting pieces of scenery lie far apart, with great, dull spaces interposed, for between Buffalo and Chicago, between Pittsburgh and Denver, there is not much natural beauty to admire.

Europe is small, and becomes still smaller when we remember that the northern and eastern two-thirds of it, all the region from the Straits of Dover to Asia at the Ural Mountains, and from the Baltic at Riga to the Black Sea at Odessa, have no scenic value. The beauties of Europe, if we except the coasts of the British Isles and of Norway, are nearly all in the Mediterranean countries and along the northern slopes of the Alps.

Within these limits there is beauty everywhere, perhaps most abundant and most perfect in Italy. Few, if any, regions in North America bring the stern beauties and the soft beauties together,

XUM

Photograph by George R. King

SHEARING TIME IN SOUTHERN UTAH

The wool-growing industry is of great importance in Utah, and cattle as well as sheep are raised successfully on many of the plains of the State, where agriculture without irrigation is impossible.

as, for instance, in the Italian valleys of the Alps or in Corsica or at Berchtesgaden.

Neither is there in North America any view of snow mountains so exquisite, in the combination of beauty and variety of mountain form, as that from the heights above the city of Sion, on the northern side of Valais in Switzerland, where the giants of the Pennine chain rise all the way from Monte Leone, on the east, to Mont Blanc, girt by his aiguilles, in the west, with the Dom and Monte Rosa, Lyskamm and Weisshorn, Rothhorn, Matterhorn, Dent Blanche, and Grand Combin standing in a glittering row behind the valley of the Rhone.

Still less is there anything so tremendous as the great views in the Himalaya, such as that from Sindeli La, on the border of Sikkim and Nepal, where the eye, ranging over hundreds of miles, discovers forty summits exceeding 20,000 feet in height, including the highest peak on the earth's surface.*

AN UNSURPASSED VIEW FROM PUGET SOUND

But, on the other hand, neither Europe nor Asia nor South America has a prospect in which sea and woods and snow mountains are so united in a landscape as in the view from Puget Sound of the great peaks that rise like white towers above the dark green forests of the Cascade Range, nor any valley gorges wilder than those of the Rockies, more beautiful than those of the Sierra Nevada.

In richness of colors, whether we think of the autumn woods of Maine or the rocks of the Western Canyons, America is preëminent.

Comparisons have their interest, but they are tiresome and profitless when they attempt to place above or beneath one another things essentially different. If I were to prolong this article by comparing the famous cities the same conclusion would we reach. The charm of Constantinople or Bombay is not that of Peking or San Francisco.

DOES AMERICAN SCENERY HAVE ROMANTIC APPEAL?

One word, however, I will add on a comparison sometimes made between European and American scenery which raises an interesting point for discussion. Some travelers say that American scenery is not romantic.

This sets one asking: What does the epithet mean? Is the romantic element in natural beauty something in the landscape itself, a particular charm of line or color which thrills us with emotion and stimulates imagination? Or does it depend on some association with human life, such as incidents in history or references in poetry, which bring Nature into relation with man and bathe rocks and woods and river banks in an atmosphere of human feeling?

If the latter view, which seems to be the common view, be correct, it would follow that romance cannot be looked for in regions where nothing ever happened, nothing—that is to say, of which civilized men have knowledge or over which no poet ever waved his magic wand.

New countries, such as western America and Siberia and Australia, cannot, therefore, have anything romantic in their landscapes till the landscapes have been associated with moving incidents, either real or imagined, by the poet's mind.

But is it clear that the latter view is correct? Are there not regions, such as parts of western America, where the human associations, historic and literary, are absent, but in which particular pieces of scenery affect our emotions and imagination in a way practically indistinguishable from that which European scenery is deemed to do?

If this be so, the distinction drawn between the two continents disappears or becomes a mere question of words. The influence of scenery on emotion is, however, a large subject, too large to be entered on here, and I leave it, content to have suggested a question fit to be considered at leisure.

*Out of the different native names which this supreme summit bears, it would seem that Chomo Kankar (the Lord of Snows) has the best claim to be adopted. It is usually called in English Mount Everest, a name given in honor of a former head of the Indian Survey, and British climbers are now attempting to scale it.—J. B.

MODERN SCENES IN THE CRADLE OF CIVILIZATION

GASHING the cool highlands of Armenia and Kurdistan, the Tigris and Euphrates flow out upon the ancient plain where the civilization that matters most to the Western World was born. Within the sweep of their changing river beds they inclose a land whose capitals at Nineveh and Babylon were once the wonder of the world.

Near the traditional site of the Garden of Eden they unite to worm their way across a blistering plain on their way to the hot Persian Gulf, or in flood-time spread across the land a sea in which their channel is obscured.

Beneath the dust of ages lie the former city sites, a primeval plain encrusted with history.

Here patient scholars, using countless spades in operations for which a scalpel might well prove too crude a tool, have won back the treasures of the past and made them speak to us. And young Rawlinson, on his way to train the troops of Persia's Shah, transcribed the inscriptions of the Behistun rock, facilitated the decipherment of cuneiform writing, and so shoved back the horizon of world history by many hundred years.

Here Britain's soldiers and administrators are trying to prepare this ancient highway for the bustling future and a gifted Prince of Mecca is trying to bring prosperity to the reborn Kingdom of Irak.

Here modern boatmen whirl in kufas such as men used at the dawn of time and Kurdish porters introduce into the racial complex of Bagdad such faces as one sees portrayed on old Assyrian tablets antedating Abraham.

Tommy Atkins playing Haroun-al-Raschid in the tortuous lanes of old Bagdad, across which New Street cuts its unromantic way, and wireless men using the traditional Tower of Babel as an aërial listening post seem novel because we still are hypnotized by the glamor of the past.

The veil of centuries has added mystery to a dull and dreary land, just as the Moslem veil has made each shadowy form, whose flowing vestments brush us as we pass, a figure full of interest.

The accompanying illustrations (Plates I to XVI), from photographs by Eric Keast Burke, who served with the Australian Expeditionary forces in the Near East during the World War, show that there is still color in this ancient land, bright, vivid flashes of it, dotting a vast, sun-baked palette.

MESOPOTAMIA IS A TWILIGHT LAND

Mesopotamia is a twilight land, never entirely awake and never wholly still. The summer roofs, deserted to the sun by day, become alive beneath the velvet dome of night, and the drama of the East gains mystery from the dim obscurity of its setting. Skies so clear that they made astronomers of the Chaldeans look down upon these roofless upper rooms, whose ceiling is the changing stars and the luminous Milky Way.

Persia has lent her lustrous tiles and soft carpets from Shiraz and Hamadan. Turkey's tarbouche adds its carmine glow to the open-air cafés. The stately Arab, in head shawl and camel-hair crown, sweeps through the streets with dignity which few can match.

Copper and brass glint from door-knocker and fruit-tray piled high with lusciousness. The tinkling armlets of the women faintly echo to the clink of ice in the huge carafes of the sherbet venders.

The hammering of huge caldrons from soft copper adds its own noisy note to the chorus. The sharp rap of markers on the backgammon boards hints idleness on the part of some desert son ensnared by city charms. From overhanging balconies the lattices drip sound muffled by silks and deep-piled rugs.

In the Occident such colors, sounds, and smells would reach high heaven by the virtue of barbaric strength; here they seem a natural attribute of the land of the Caliphs.

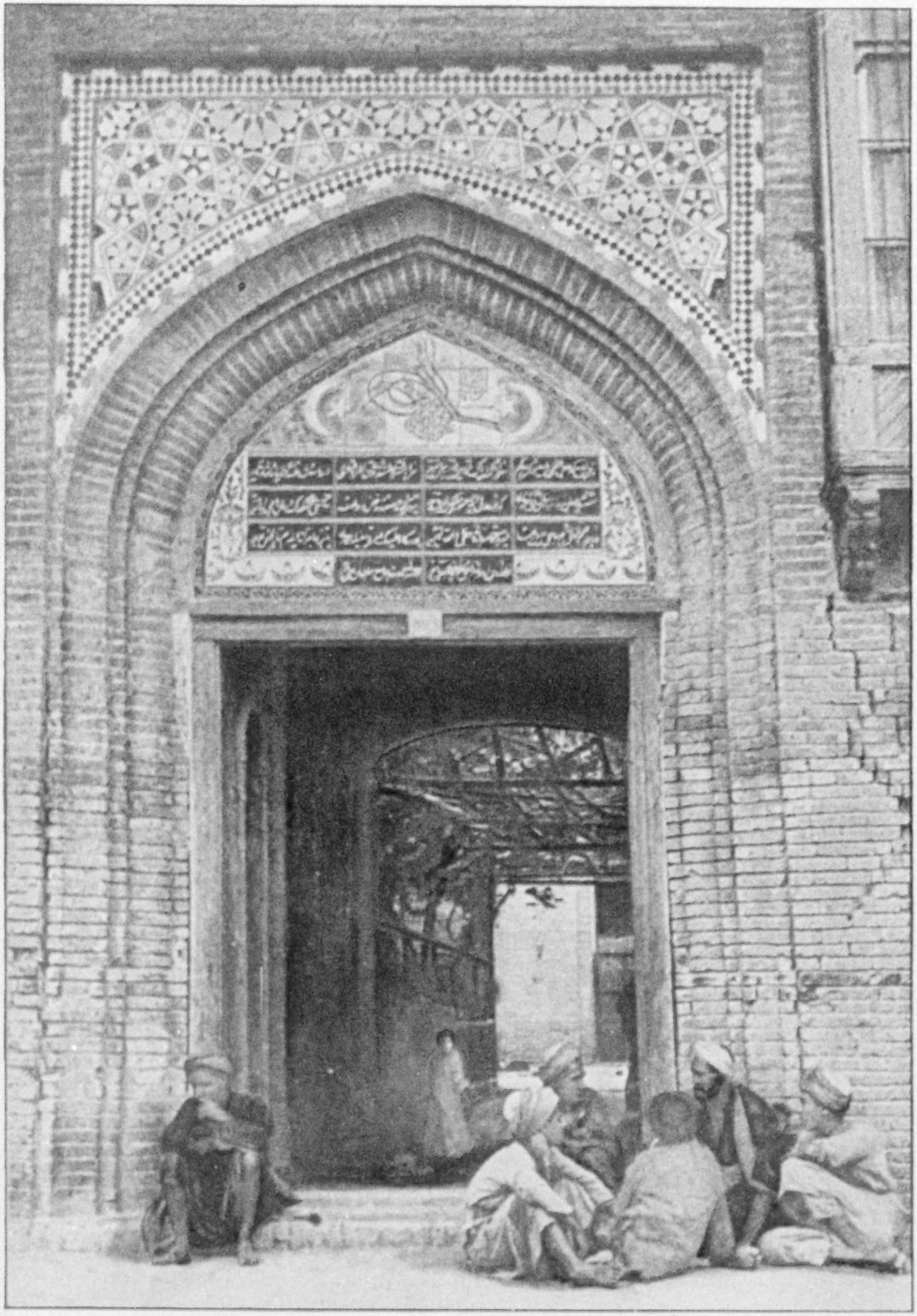
To see Mesopotamia clearly is to tear aside the curtain of romance which exaggerates her charms. Viewed in a dispassionate light and by Western standards, she cannot be thought beautiful; but when one lets the ancient spirit of the land unfold its spell, the past is eloquent and in the moonlight of imagination rude mud huts become towering, dimly lighted palaces of the shadowy past.

Mesopotamia can be cold. The salubrious winters of the Nile never become so chill. But summer beats down with

Photograph by Eric Keast Burke

BURDEN BEARERS OF MESOPOTAMIA

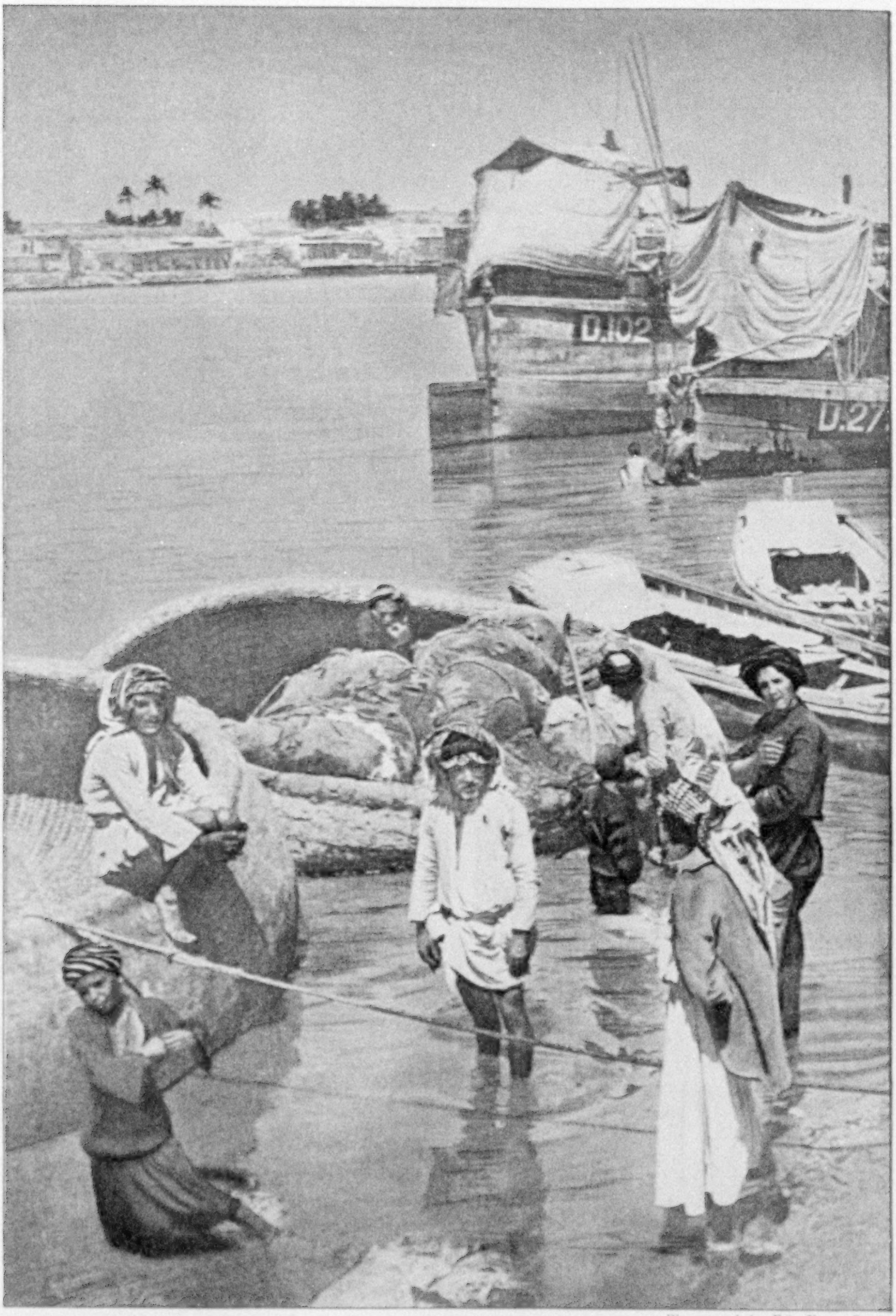
In the land of the Garden of Eden, human labor is so cheap and plentiful that machinery cannot compete and therefore most burdens are carried on men's backs. These coolies from the Kurdish foothills are identified by their headdress, a felt cap with a turban, and each carries around his neck the tool of his trade, a plaited strap of great strength, with which he secures his load—an upright piano, a great packing case or whatnot. Their profession is relatively well paid and after a few years' work in the city, the villager returns home with a competency.



Photograph by Eric Keast Burke

THE IRIDESCENT GATEWAY OF A MOSQUE IN BAGDAD

Richly colored tiles arranged in geometrical designs distinguish the mosques in the city of Haroun Al Raschid. Because the Moslems are forbidden by their religion to represent living things in art their development of ornamental designs is worthy of note. Over the door of this mosque, between the stars and crescents, is an adaptation of a Turkish sultan's signature in Arabic which has been utilized with considerable decorative effect. The multihued robes of the loiterers before the entrance remind one of similar scenes at Bokhara and Samarkand.



Photograph by Eric Keast Burke

RIVER CRAFT OF MESOPOTAMIA

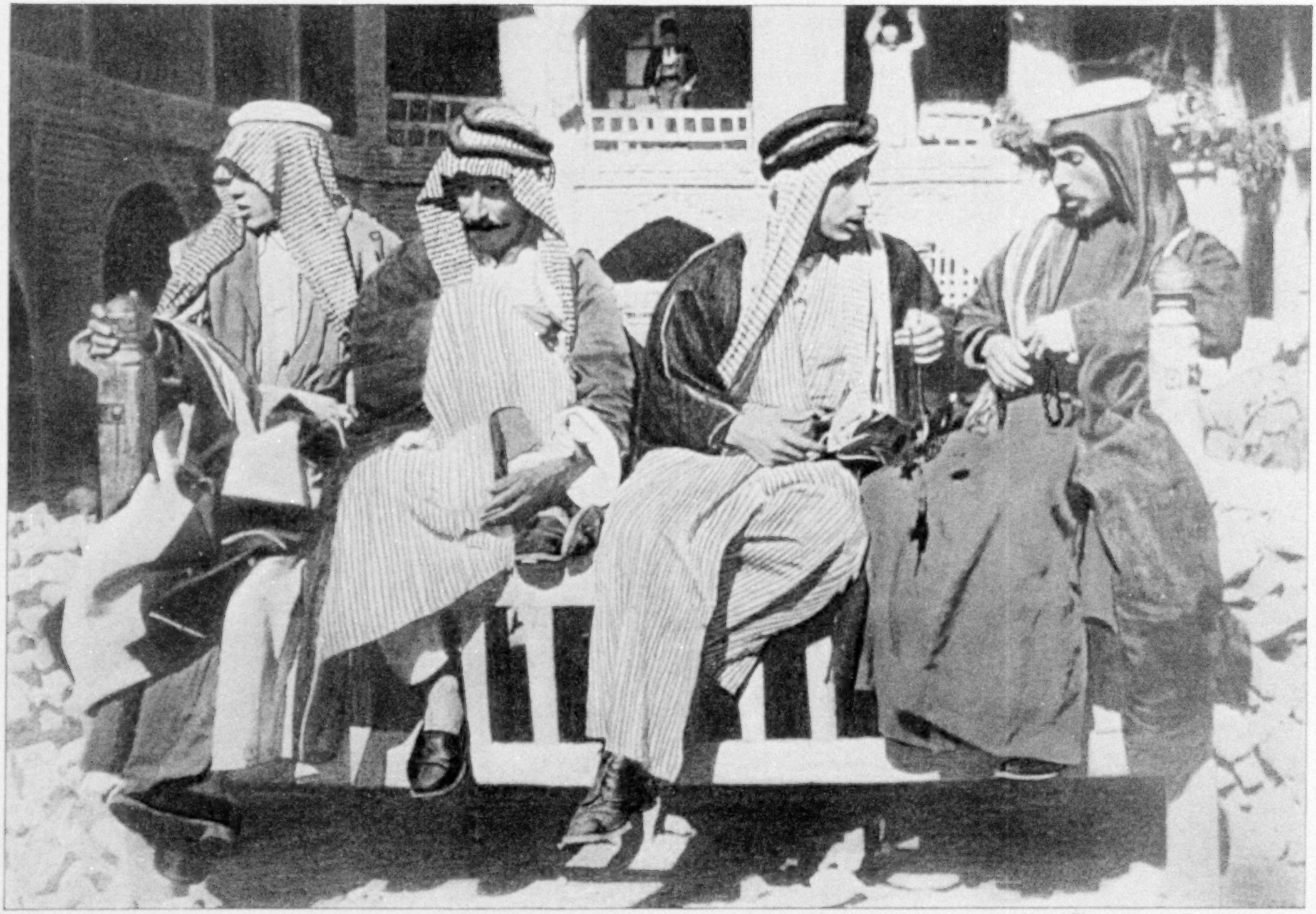
On the waters of the Tigris and the Euphrates, the rivers which enclose Mesopotamia and give it its name, ply the curious kufas, circular boats which are large enough to carry a dozen men or half as many horses. These boats are of basketwork covered with bitumen, or mineral pitch, such as was used for mortar in the building of the walls of Babylon. Being rudderless, they whirl and bump here and there as they transport native cargoes on these historic streams.

XUM

Photograph by Eric Keast Burke

"MI-LORD, THE CARRIAGE WAITS"

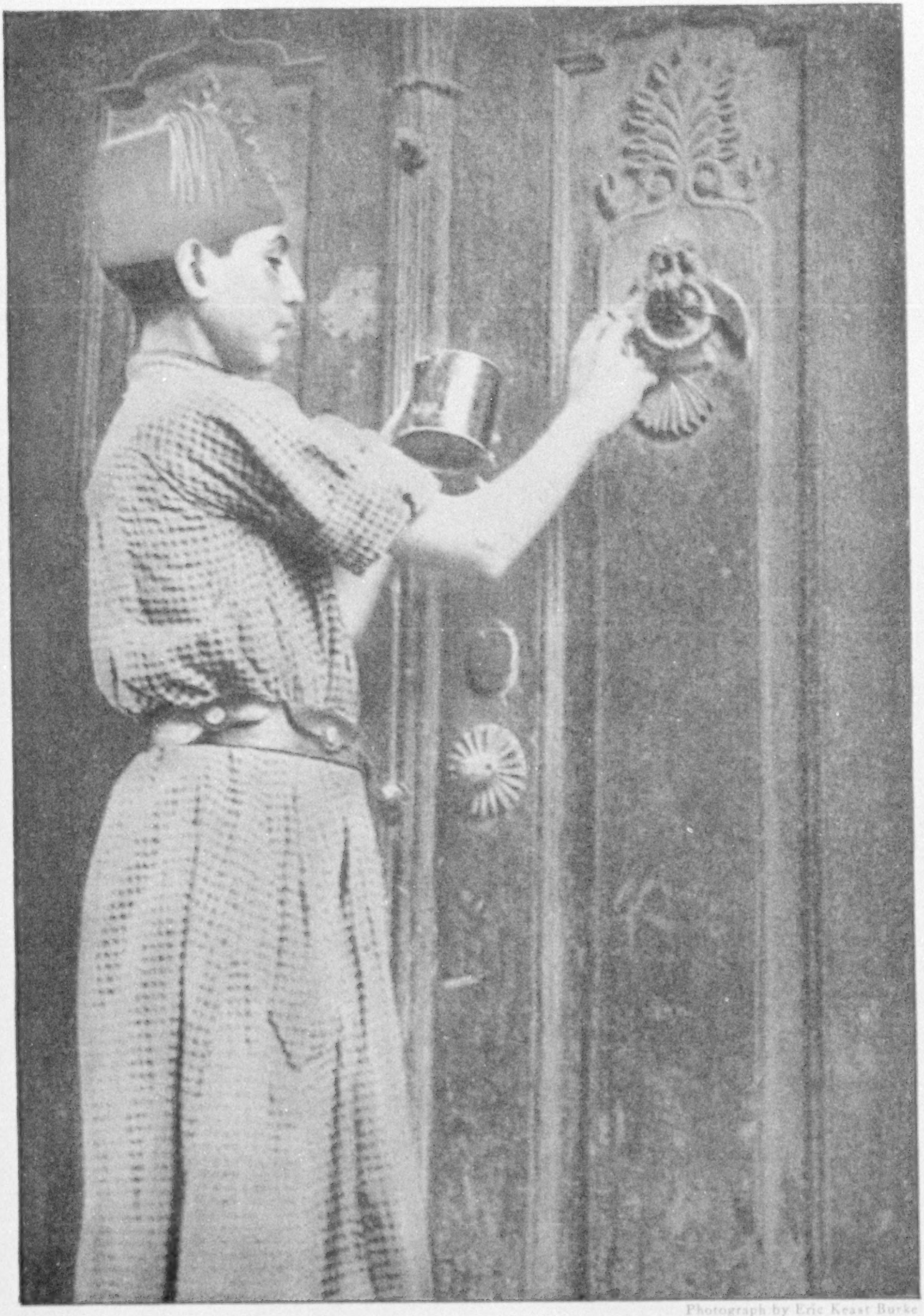
This gaily caparisoned but sleepy-looking steed does not appear to require two grooms, but there is no paucity of human help for an easy job in the languorous East. The heavily padded Arab saddle, shaped like a half-hogshead, while exceedingly picturesque, is a model of discomfort with its short stirrups. To sit astride one at a gallop is to appreciate the joys of walking.



Photograph by Eric Keast Burke

CLUB LIFE IN MESOPOTAMIA

The outdoor coffee-house is the club of every town. Here the men exchange opinions on politics and trade. The head scarf, with its camel's-hair rope to hold it in place, is a conspicuous feature of Arab costume, and the native will wear American shoes long before he will adopt the Britisher's pith helmet. The protection from the scorching sun afforded by the scarf to the back of the neck makes it a safe headdress for the European in tropical countries.



Photograph by Eric Keast Burke

"POLISHING THE HANDLE ON THE BIG FRONT DOOR"

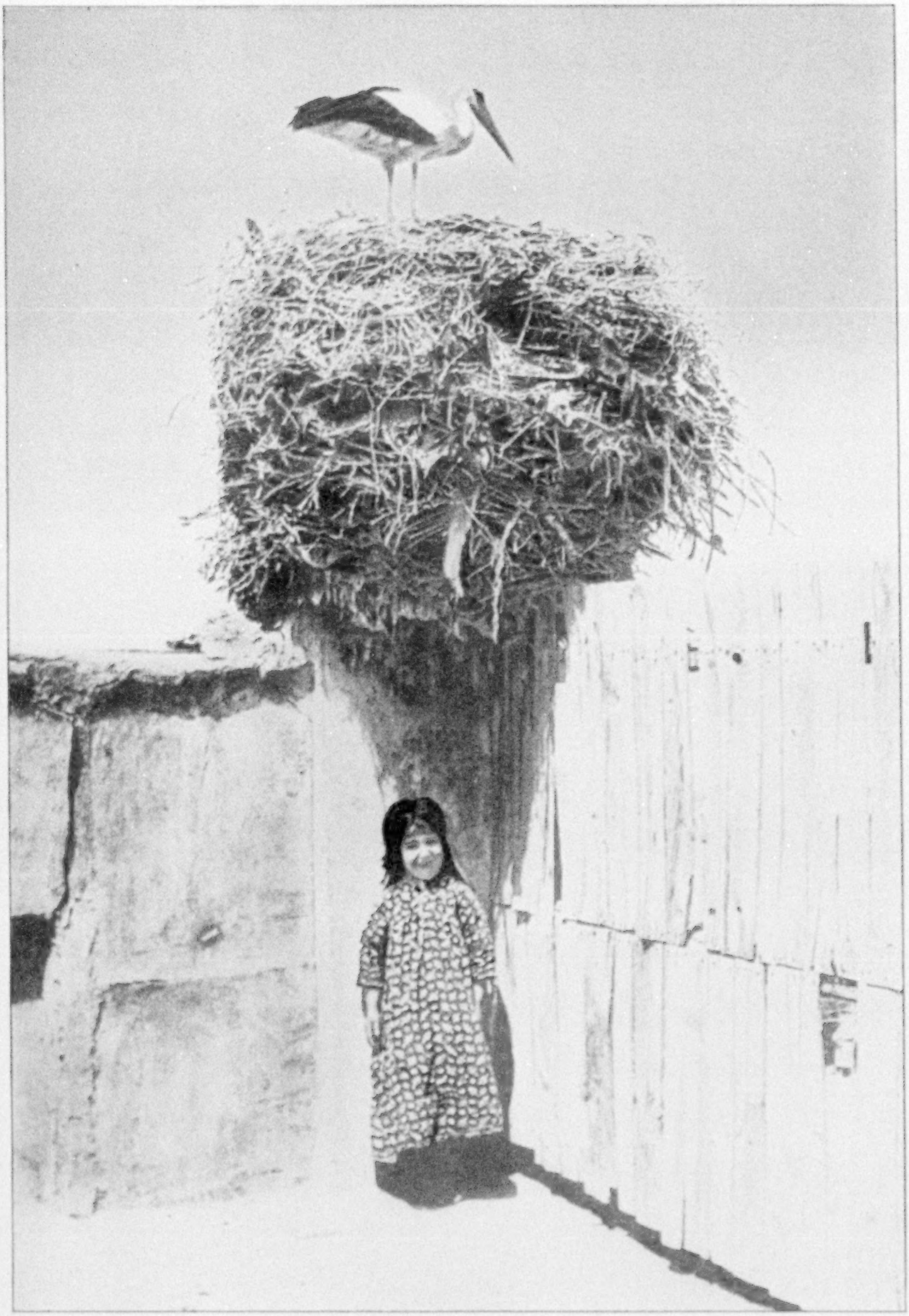
Door knockers are popular in the larger centers of population in Mesopotamia and are made in large quantities by the brass founders in the bazaars. The brass commonly used throughout the East is of a golden hue, but recently white brass, made by increasing the zinc content of the alloy, is becoming common. Bronze was more often used in olden times, but was called brass.

Photograph by Eric Keast Burke

JONAH'S TOMB UPON THE SITE OF ANCIENT NINEVEH

Because the Mohammedans consider this mound a holy place, no excavations have been permitted. Some explorers, however, have obtained a few relics by digging in the cellar rooms. It is interesting to observe how many Christian notables, such as Daniel, Ezekiel and Abraham, are also revered by the Mohammedans. There is a mosque to Jesus, son of Mary, in Damascus to this day.

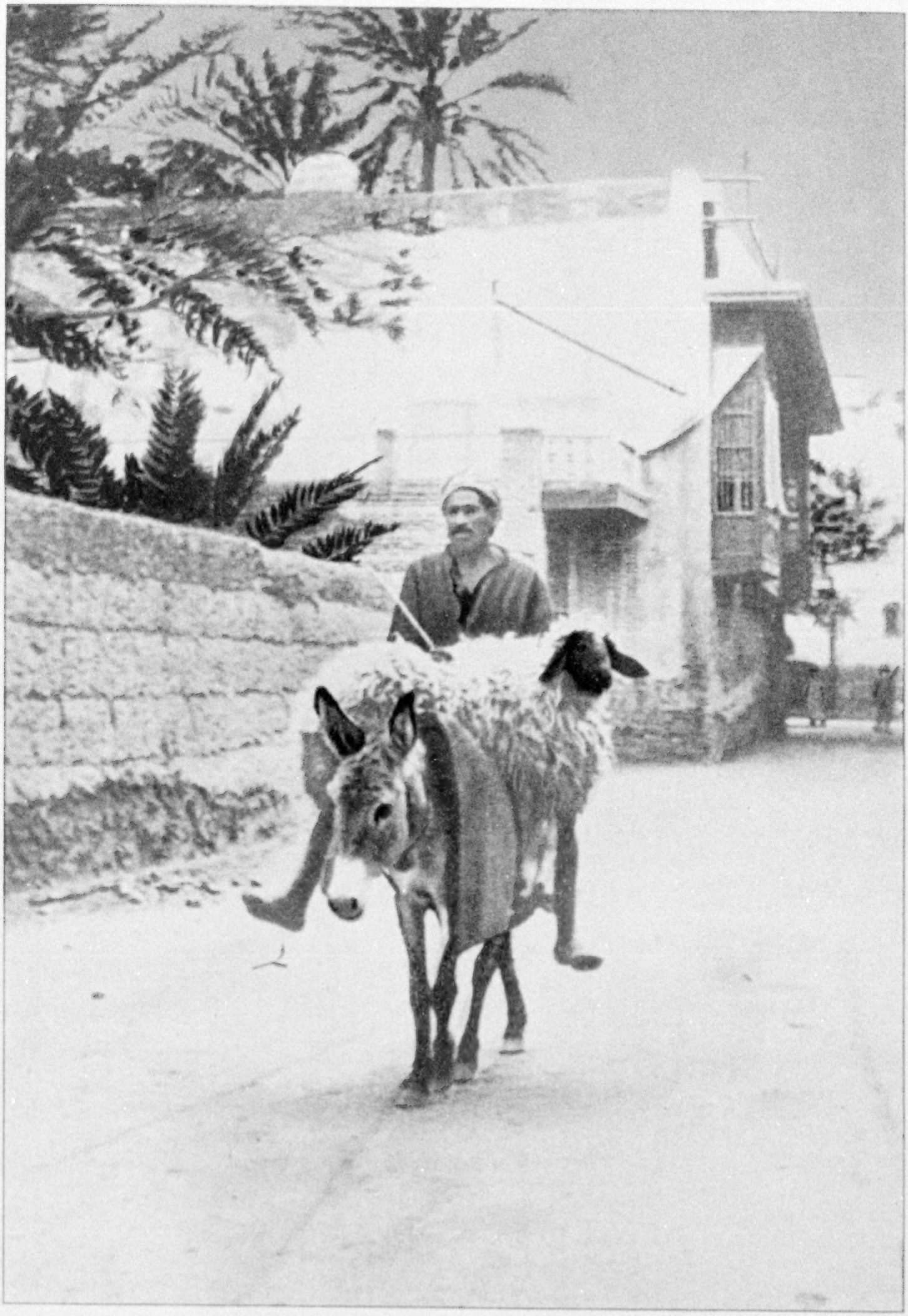
XUM



Photograph by Eric Keast Burke

A FRIENDLY STORK AND HIS GIFT TO A MESOPOTAMIAN FAMILY

Storks are regarded with as much favor in the East as in parts of northern Europe, and their enormous nests are a familiar feature of the landscape, particularly in the villages of the Kurdish foothills. Good luck is supposed to visit the house chosen by the stork as a nesting place. In Turkestan, the storks nest on the domes of mosques as well as on the roofs of dwellings.



Photograph by Eric Keast Burke

THE CAMEL'S COMPETITOR

These patient little burden bearers are usually overloaded because the owner puts on the load and then clambers on himself. The favorite amusement of some of the British soldiers during the World War was to make each driver dismount and give his beast a rest as he passed their camp. Neither bit nor bridle being used, change of direction is achieved by striking the animal on the side of the head opposite to which it is desired to proceed. The question naturally arises, "Why shouldn't the sheep carry himself?"

XUM

Photograph by Eric Keast Burke

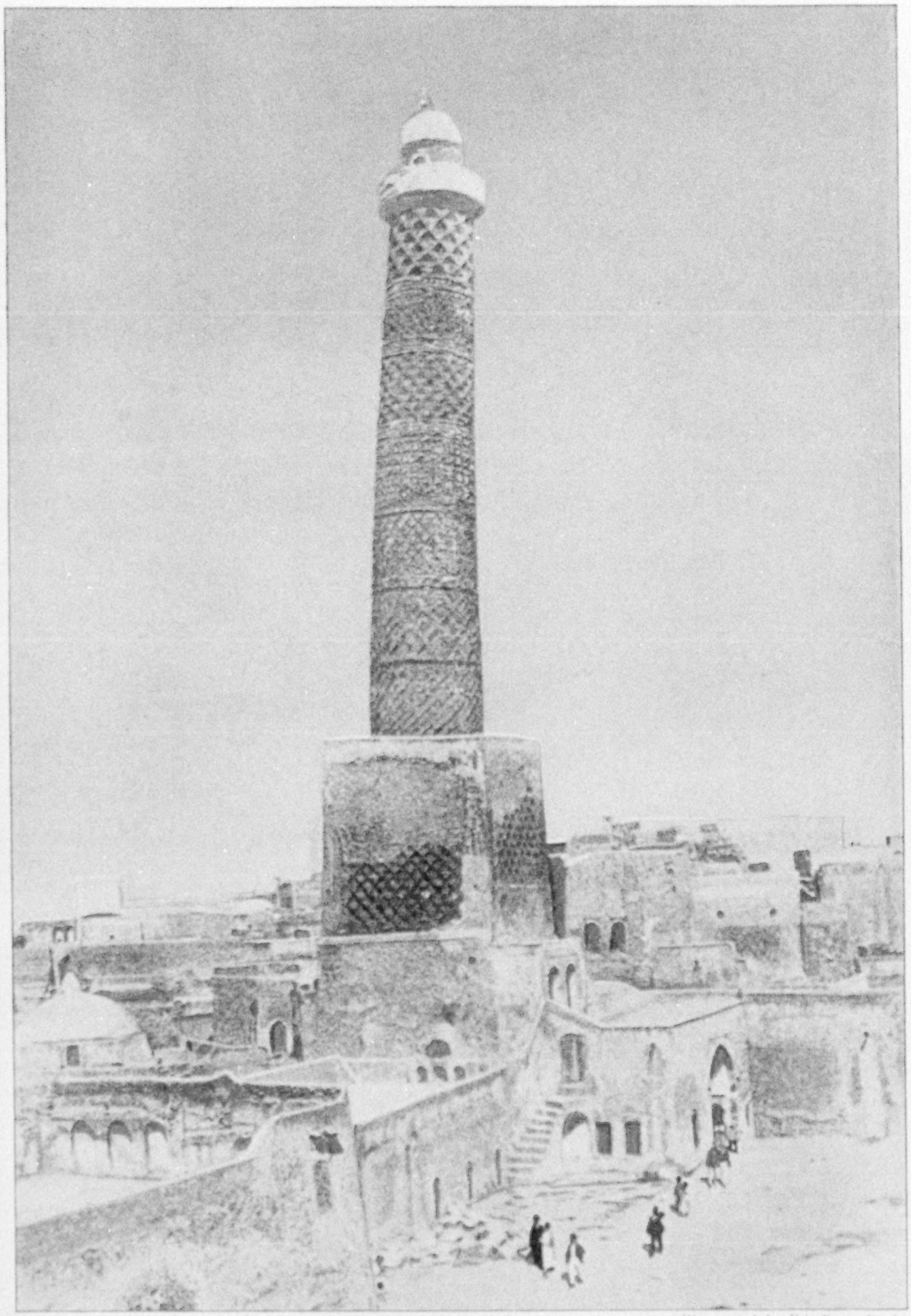
A MOSLEM MENDER OF CHRISTIAN SOLES

The favorite footgear of the Bagdadians is the yamanis, a red or yellow slipper without a heel, and while a more modern style has recently been set by the British in this ancient land, the native populace is slow to change. Tight shoes may be modern, but a bare foot thrust into a flappy sandal or a heelless slipper is likely to be more comfortable.

Photograph by Eric Keast Burke

CIRCUS LEMONADE IN BAGDAD

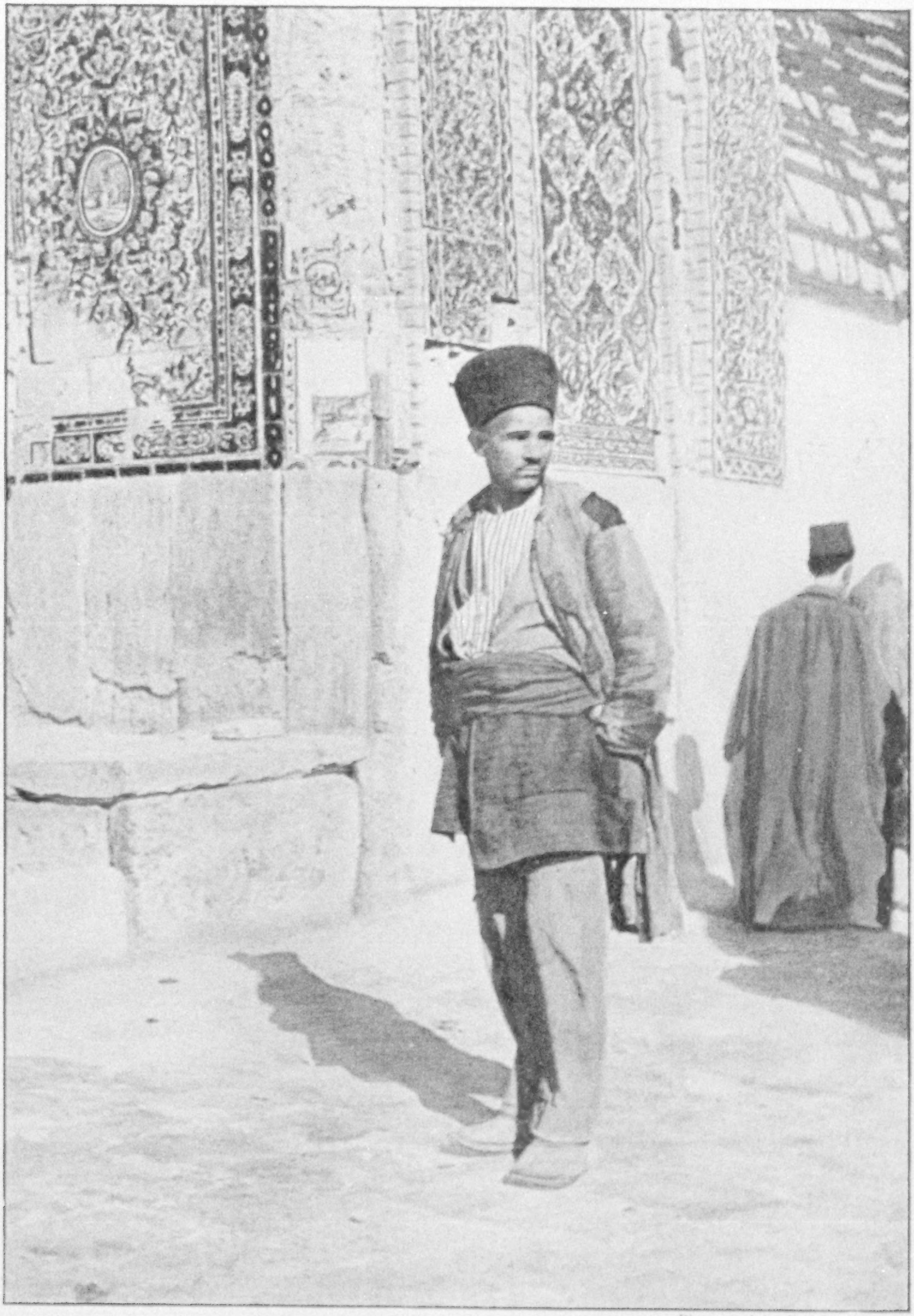
The glasses and copper vessels contain drinks of gaudy colors and a sweetness which makes them unpalatable to the Westerner. The proprietor is driving off the flies with a bit of palm leaf. The woman on his right is enjoying a well-earned rest after disposing of her stock of homemade flaps of bread (khubz) which she had been vending from the flat basket at her feet.



Photograph by Eric Keast Burke

THE LEANING MINARET OF THE GREAT MOSQUE OF MOSUL

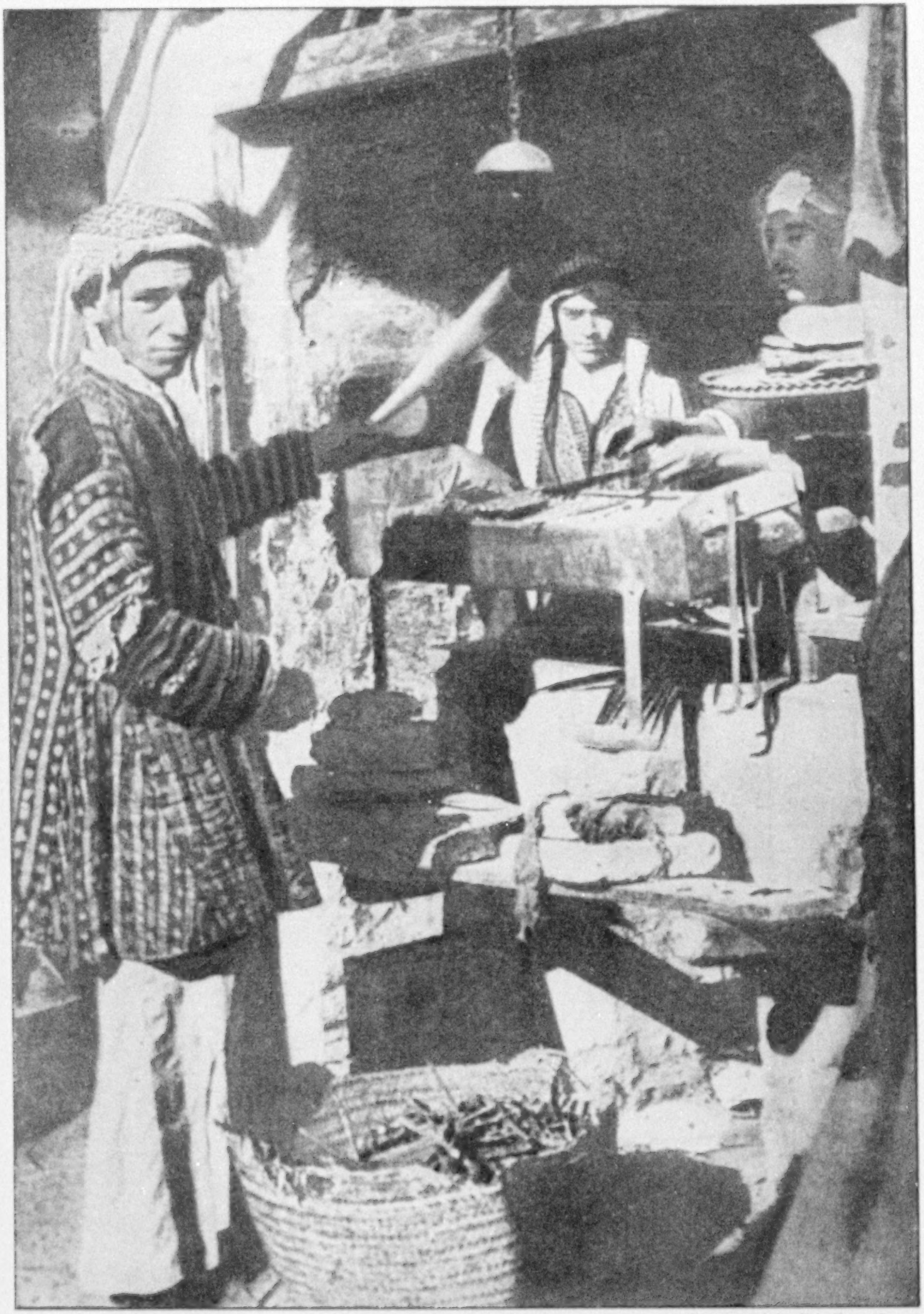
An Arab legend relates that the tower bowed its head in reverence to Mohammed when once he passed that way, and was unable completely to recover its equilibrium.



Photograph by Eric Keast Burke

A YOUNG PERSIAN PILGRIM AT KAZIMAIN

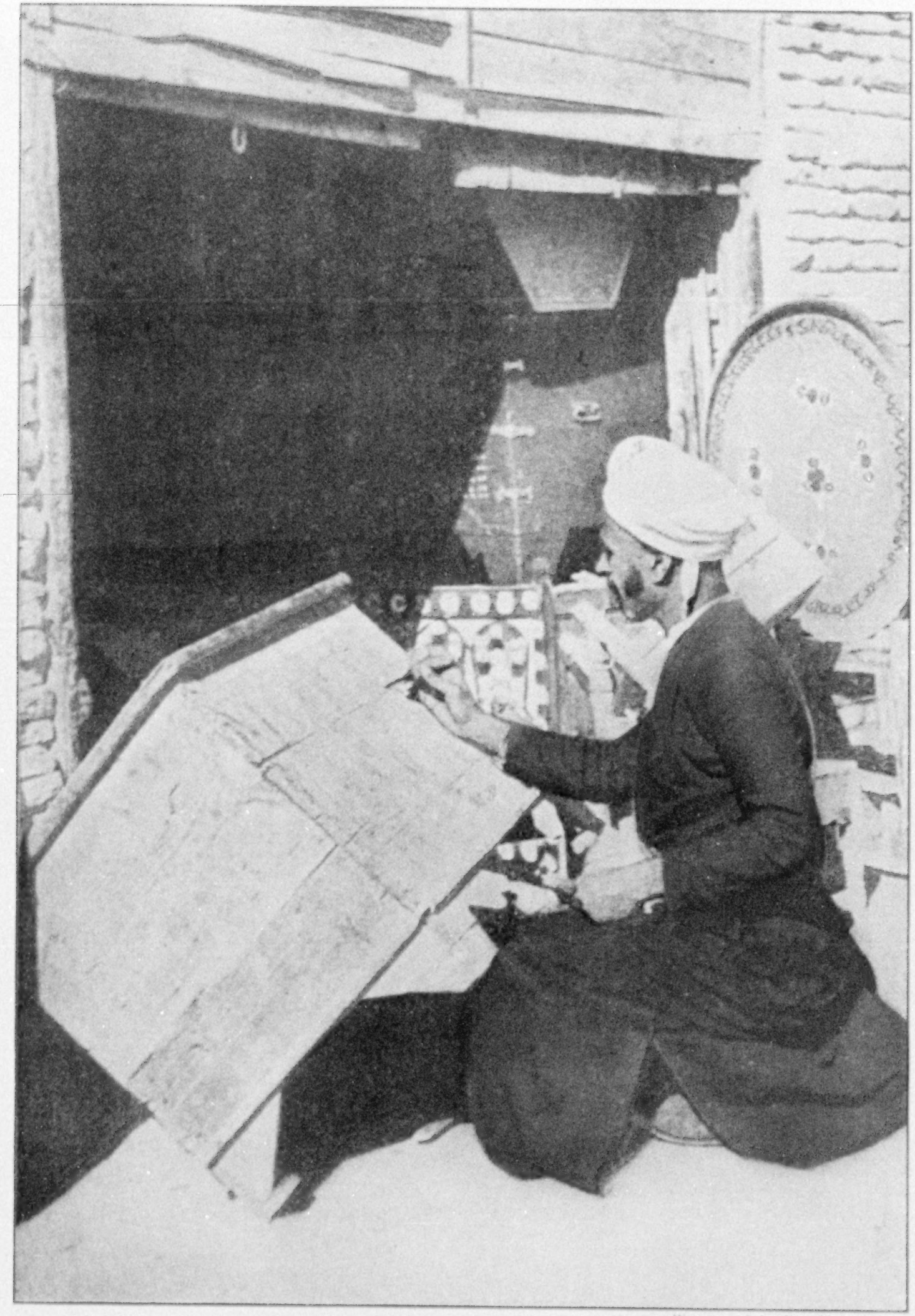
The resplendent tiled facades of the tomb-mosques of Kazimain and those at Samarra and Kerbela Nejef attract pious pilgrims of the Shia sect to which many Persians belong.



Photograph by Eric Keast Burke

A CUISINE "A LA MESPOT"

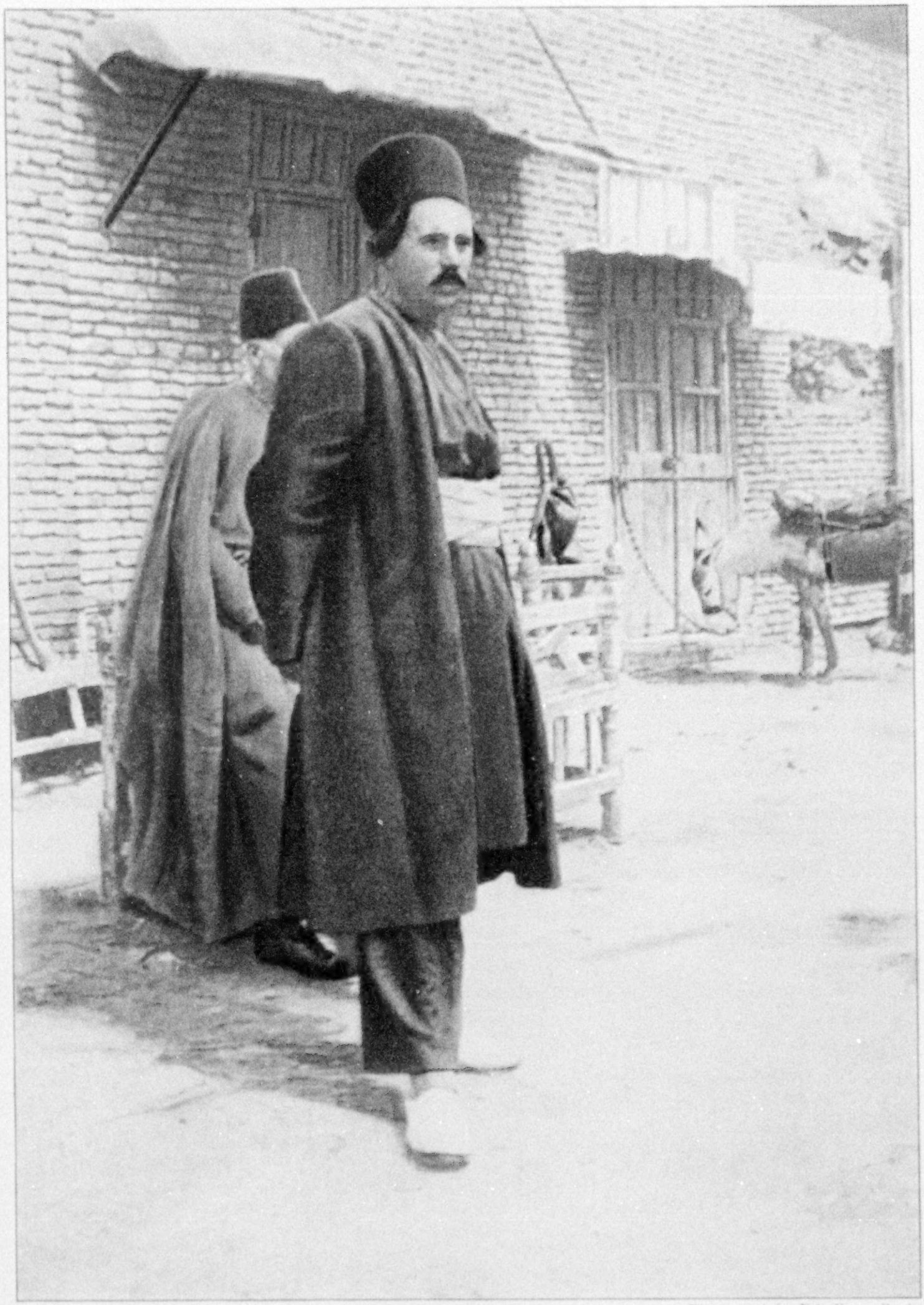
In this cookshop of the bazaar the chef is roasting little squares of meat called kibobs on spits over the red embers of a charcoal fire which his assistant keeps aglow with a fan. When they are done to a turn he will wrap them in a flap of bread (khubz) from the copper tray at the right and serve them to a customer. Fresh kibobs have a rare appeal, and when the customer has completed his meal he counts the spits and pays accordingly.



Photograph by Eric Keast Burke

A CARPENTER AND DECORATOR BESIDE THE EUPHRATES

This chest when it is gaily decorated will probably form the "hope chest" or "glory box" of an Arab lady. Wood is scarce in many parts of the East, hence is highly valued. Much labor is expended in decorating it and inlays of alternate silver and mother-of-pearl are frequently seen. The painted tray is of copper and has been decorated to order by some gentleman who has a banquet in view. In other parts of the Near East, damascened brass trays inlaid with silver and copper figures are common.



Photograph by Eric Keast Burke

A PERSIAN IN BAGDAD

He is one of an interesting element in the Mesopotamian population. In Bagdad, Persians earn a livelihood by trade and as carriers to their own country. From earliest times, when this city was the crossroads of the East, these people have been familiar sights on the streets. They are easily identified by the peculiar hat, like a brimless derby, for the Arab wears a head scarf and the Jews and Armenians wear the tarbush or fez. (See color plates V and VI.)

a violence that makes one realize that only by the sweat of many brows was civilization nurtured here, amid natural forces against which modern man must needs renew the fight if the land is once more to blossom as the rose, with crops three-hundred-fold, such as Herodotus described.

MARSHES MAY BE REDEEMED

Far to the north lies the plateau which stretches from the Taurus to Mount Ararat, bitter cold in winter, though with a clear sky which makes the noon delightful, even beside the ruined homes of Van. In spring, warm rains descend, the summer rushes north, and heavy snows which block the mountain roads melt quickly on the slopes, from many of which the forests have long since disappeared.

Through the rounding country of Assyria and the Hittite lands the Tigris and Euphrates flow, confined by cliffs and hills to comparatively narrow valleys; but at the fall-line which marked the boundary as well as the difference in geographic character between Assyria and Babylonia, the piled-up waters tend to spread across a wide alluvial plain.

Once the floods were laboriously tamed and turned aside to reservoirs and there impounded against a later need; but even then the lower plain was so submerged that dikes were built to save the towns and fields from devastating waters. Now the old canals are clogged with silt and useless marshes occupy the fields where a hungry world might win back a spreading granary.

Slowly the rivers are carrying down their delta to the sea and pushing back its tides; but man has not kept pace with this slow growth nor claimed the land thus made. Optimists see the day when the twin rivers, once more tamed, will bring prosperity through irrigation and drainage directed by Western engineers.

Wrestling with the raging waters and tried by the heat and cold of a savage climate, the Babylonians not only became strong, but came to understand the irrigation problems higher up the rivers, and thus sought to extend their sway over the region where the water supply could be stored up.

The rivers offered life and peace in return for toil, and man gradually conquered natural forces until great cities rose above the wide clay plain and muddy floods. Sumer, Akkad, Babylonia, Assyria grew through toil and held their position through constant vigilance on the part of their people; but the day came when man, at war with other men, withdrew his supervision. Silt and flood came down to drown the city states and hide their corpses under shapeless mounds.

When one enters the Shat-el-Arab and passes through the swamps that lie below Abadan, he realizes that here the combined Tigris and Euphrates have spewed forth their load of silt throughout the centuries until the shore-line of the Persian Gulf has retreated for a hundred miles.

Ocean liners run up to Basra, a modern, bustling port on the Shat-el-Arab. Here one is shown the house of Sinbad the Sailor, for traditions live longer than human beings in such a feverish land, and the visitor can picture a scene which has not changed since the Caliphs ruled; but as one listens to a camel roaring a useless protest in the bazaars, the deep whistle of a modern steamship booms forth to remind one that the twentieth century cannot wait for dreams.

A LAND OF COLOR AND DREAMS

Bagdad, with its melons and kufas, desert Arabs and veiled women, whose veils are becoming distressingly thin, deserves a story of its own.

Here and there in old Bagdad itself we have seen tiled doorways and domes that hint of loveliness which is not wholly gone; but when the twilight comes and one looks west above the flat mud roofs of the city, one sees, across the Tigris, the golden domes and minarets which rise above the mosque of Kazemain.

Upon those domes, outlined as black as night against the sunset sky, one marks the crescent, which lies like a kiss from heaven on their matchless curve; and then one realizes why this ancient land is still Irak and why an Arab noble, wearing desert garb, there rules as king. Mesopotamia, rescued though it be by engineering skill which shall reclaim the marshes and supplant the creaking water-hoists, will still remain the East, the land of color and of dreams.

XUM

Photograph by Donald Ferguson

WEDDELL GLACIER ENTERING ROYAL BAY: ISLAND OF SOUTH GEORGIA

This majestic river of ice was named for the Englishman, James Weddell, who visited South Georgia one hundred years ago. It was on the shores of this bay that the staff of the German *Transit of Venus Expedition* of 1882-83 spent a year, adding much to the world's knowledge of the natural history of this outpost of the Antarctic (see text, page 417).

SOUTH GEORGIA, AN OUTPOST OF THE ANTARCTIC

By Robert Cushman Murphy

American Museum of Natural History

With Illustrations from Photographs by the Author

ON JANUARY 4, 1922, the little *Quest*, one of the most romantic of the many vessels which have sought to pry into the cold secrets of the South, lay in the sheltered basin of Grytviken (King Edward Cove), Cumberland Bay, South Georgia, an island outpost of the Antarctic lying more than 1,000 miles east of Cape Horn. Repairs had been completed, following the battering of a stormy passage from England by way of Lisbon and Rio de Janeiro, and she was awaiting the signal to purchase her anchor.

The commander, cheerful and active as usual, had been ashore at the whaling station, arranging final details for the morrow's departure into the fogs and summer ice-flows of Weddell Sea.

But for him that morrow was never to dawn; before daybreak of January 5 the responsibility of leadership had fallen upon other shoulders. With the faith and determination which characterize both seafarers and men of science, the members of the British Antarctic Research Expedition were making their plans to carry on without the inspiration of the commander's presence.

A great-hearted Irishman, a hero of three earlier polar voyages, a leader who had repeatedly shown his readiness to lay down his life for his friends—Sir Ernest Shackleton—was dead in the cabin of his tiny craft, at the very beginning of investigations which would have furnished a worthy capstone for his career.

SHACKLETON'S THRILLING TRIP TO SOUTH GEORGIA FOR HELP

Strangely enough, the distant isle at which Shackleton came to an untimely end had already been associated with important incidents of his life as an explorer. In 1914 he made South Georgia the first southern base of the *Endurance*, and it was here that he took aboard his final stores before going southward in December into Weddell Sea.

Here, too, the members of the expedition waited anxiously but vainly for tidings of the war, which had broken out just before the *Endurance* left England under orders from the Admiralty to "proceed" in spite of the impending conflict. Barely two hours after the polar ship had departed from Cumberland Bay, the steamer *Harpon* arrived from Buenos Aires with news and mail—too late.

Shackleton's even more dramatic association with this ice-bound island came, however, in May, 1916, when, after the loss of the *Endurance*, he made a marvelous two weeks' journey in an open boat from Elephant Island, of the South Shetland group, to the southwestern coast of South Georgia. The leader and two companions crossed the mountains from King Haakon Bay to Stromness Bay, a terrific journey of thirty-six hours, which is vividly and stirringly described in his book "South" (see map, page 412).

THE EXPLORER MISTAKEN FOR THE MATE OF THE "DAISY"

If Sir Ernest had headed directly north and had followed a line of march which the whalers have used on their Sunday holidays for years, and which was subsequently pointed out to him on my personal sketch map of South Georgia, he would have arrived within three or four hours at the whaling station in Prince Olaf Harbor, near the mouth of Possession Bay; but at the time he was unaware of the existence of this station.

When he and his comrades finally reached the Tonsberg Company's station in Husvik Harbor, Stromness Bay, the first persons whom they met ran off as if they had seen the devil himself, and as a welcome relief to the physical and nervous strain to which the wanderers had been subjected, the following ensued:

THE "QUEST," SIR ERNEST SHACKLETON IN COMMAND, PASSING UNDER THE TOWER BRIDGE OF THE THAMES: LONDON

The noted Antarctic explorer sailed from London in September, 1921, on an expedition to the South Polar regions which was to have extended over a period of several years.

We came to a wharf, where the man in charge stuck to his station. I asked him if Mr. Sorlle (the manager) was in the house.

"Yes," he said, as he stared at us.

"We would like to see him," said I.

"Who are you?" he asked.

"We have lost our ship and come over the island," I replied.

"You have come over the island?" he said in a tone of entire unbelief.

The man went toward the manager's house and we followed him. I learned afterwards that he said to Mr. Sorlle: "There are three funny-looking men outside, who say that they have come over the island and they know you. I have left them outside." A very necessary precaution from his point of view.

Mr. Sorlle came to the door and said, "Well?"

"Don't you know me?" I said.

"I know your voice," he replied doubtfully. "You're the mate of the *Daisy*."

"My name is Shackleton," I said.

This episode proved of particular interest to me when I first read in "South" the glorious tale of the rescue by Shackleton of the Elephant Island party, for the *Daisy*, now at the bottom of the Atlantic, was my brig.

Following hard upon word of the explorer's death, in January, came the announcement that Lady Shackleton had decided to have her husband's remains sent back from Montevideo to South Georgia for interment. What could be more appropriate than that Shackleton should lie forever at the Gateway of the Antarctic—in the green and mossy hillside between Grytviken and the talus of the granite coast range, within sight of glacier-lined fjords and the icy crest of the Allardyce Alps?

THE FIRST SOUTH POLAR LAND KNOWN TO MAN

In view of the connection, which will henceforth be perpetual, between South

GRYTVIKEN, CUMBERLAND BAY, WHERE SIR ERNEST SHACKLETON DIED

This whaling station on South Georgia is also known as King Edward Cove. Shackleton's ship, the *Quest*, which had anchored here for repairs, was ready to resume its voyage to the Antarctic when the famous leader was stricken (see text, page 409).

Georgia and a man whom all the world mourns, it is of timely interest to recount the history and to describe the geography and life conditions of the island.

This is all the more true because South Georgia is, in every sense, a very type and epitome of all the subantarctic regions. It was, moreover, the first South Polar land known to man and it was discovered during the golden age of exploration.

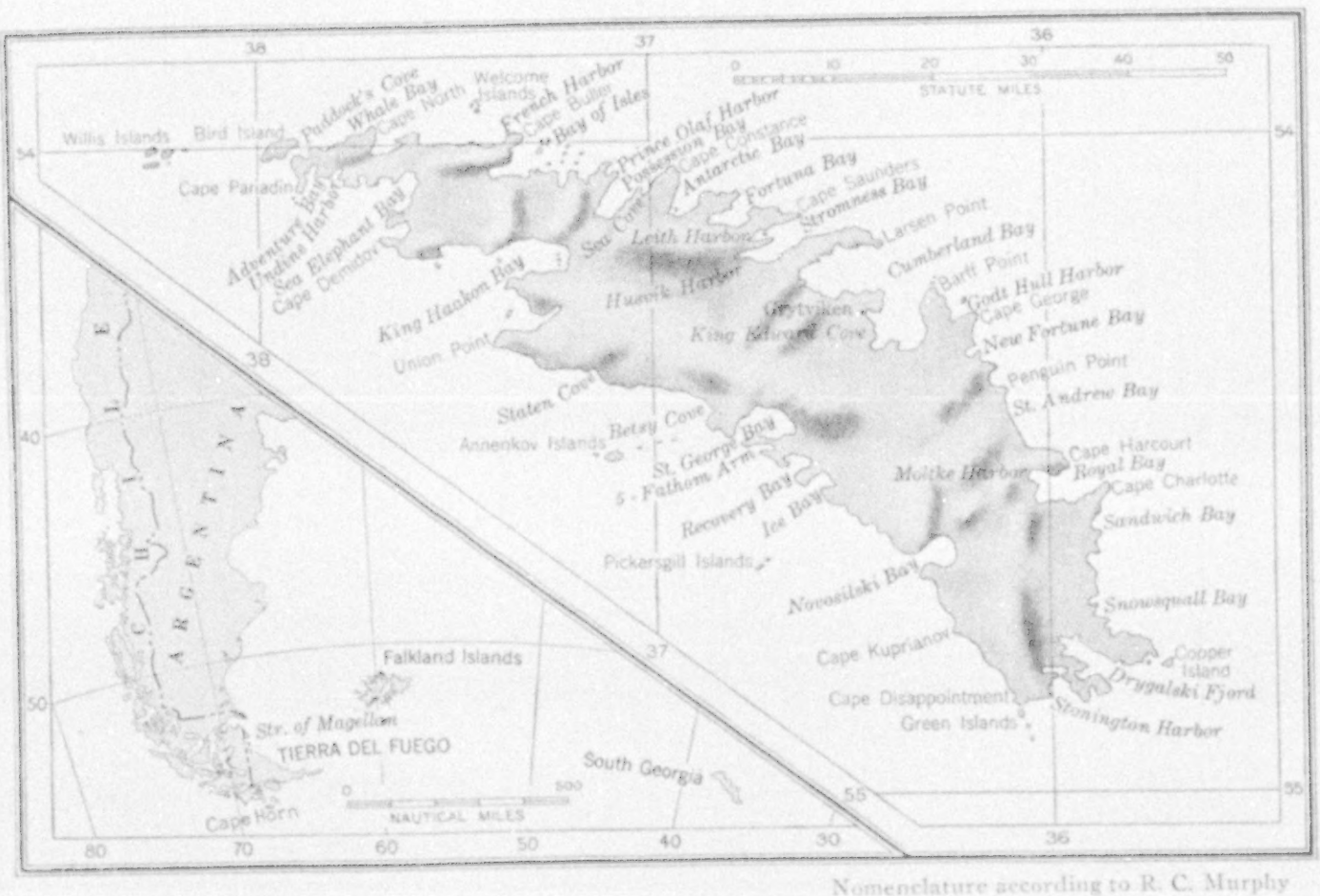
DISCOVERED BY JAMES COOK IN 1775

Until the latter part of the eighteenth century, maps of the world commonly included a conjectured landmass lying south of the known continents and labeled *Terra Australis Incognita*. From time to time since the discovery of America, vague reports of southern land had been brought to Europe by mariners who had been blown southward out of their course, and contemporary geographers had held persistent hopes for the discovery and exploitation of an austral continent which might add a second New World to the globe.

During the week beginning Sunday, January 15, 1775, James Cook, commander of H. M. S. *Resolution* on a voyage in search of this *Terra Incognita*, was cruising along the coast of an ice-covered island in latitude 54° 30′ south. The isle had appeared unexpectedly in the path of the *Resolution*, and it was the first assurance of the disappointment in store for mankind.

The discoverer was somewhat depressed on seeing the barrenness of the new land, whose rocky shore and cliffs of ice were but gloomy auguries for a habitable territory lying still nearer the Southern Pole.

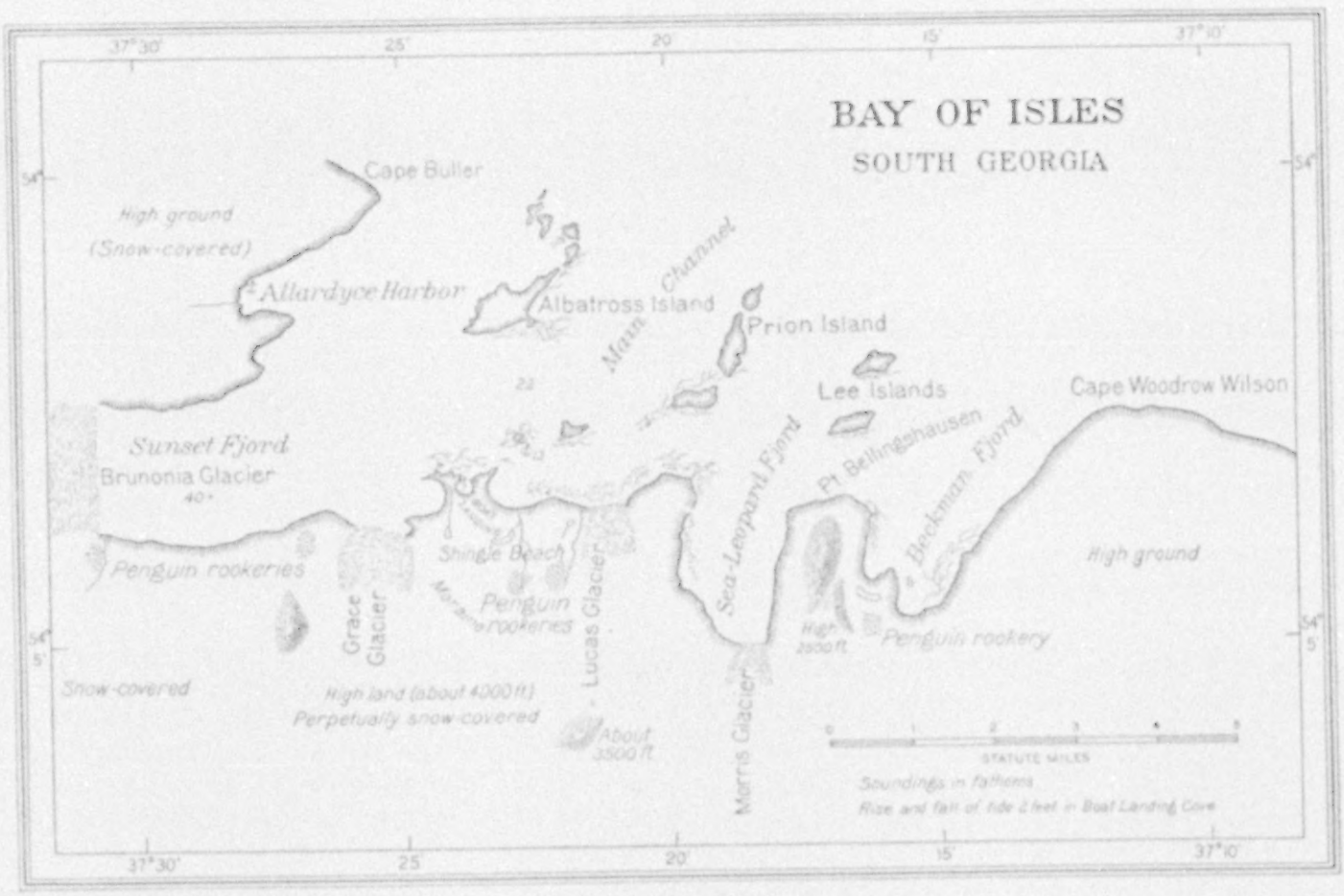
"The wild rocks," Cook entered in his journal, "raised their lofty summits till they were lost in the clouds, and the valleys lay covered with everlasting snow. . . . The very sides and craggy summits of the mountains were cased with snow and ice, . . . and at the bottom of the bays the coast was terminated by a wall of ice of considerable height. . . .



Nomenclature according to R. C. Murphy

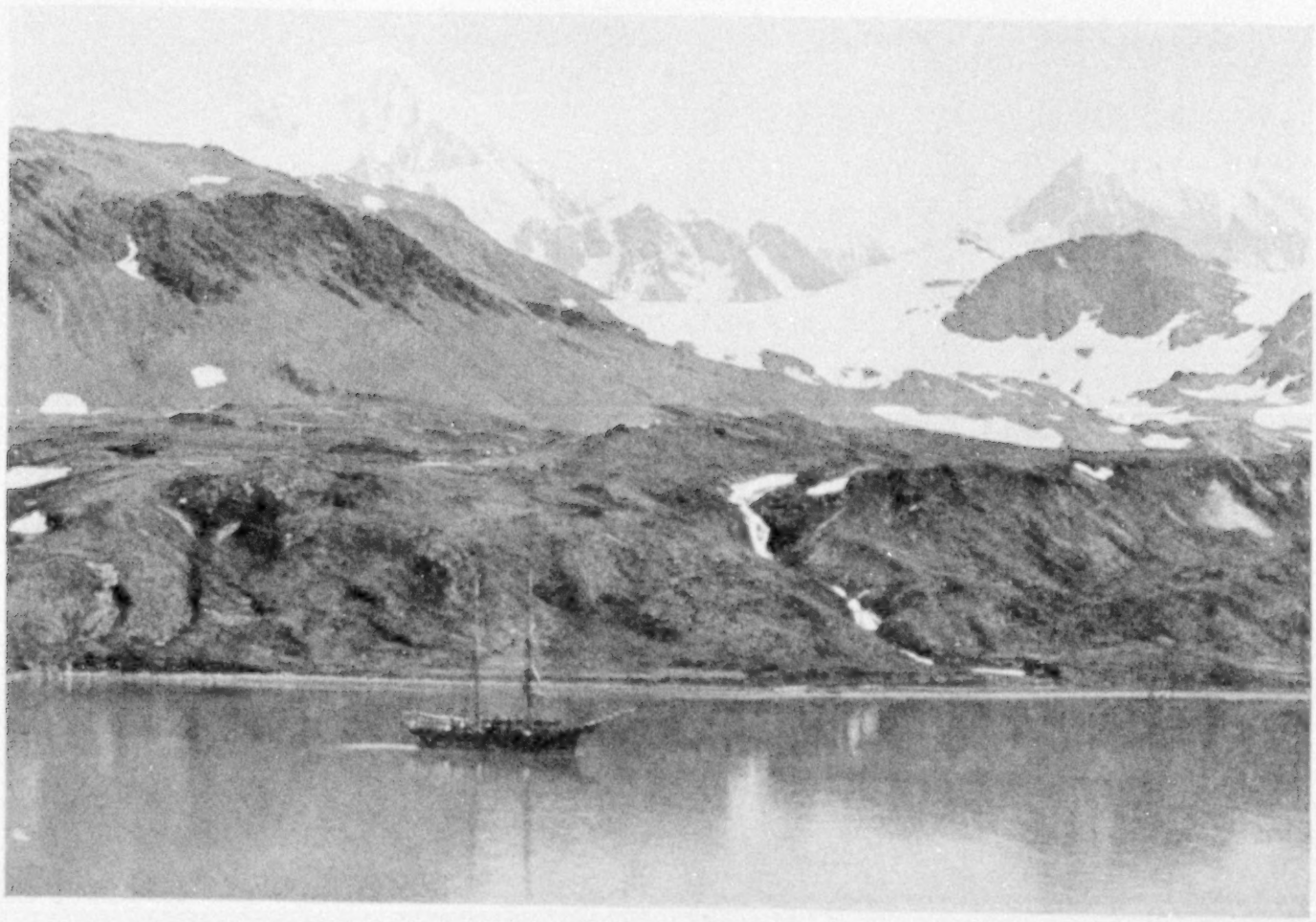
THE ISLAND OF SOUTH GEORGIA, OUTPOST OF THE ANTARCTIC

It lies in the South Atlantic, more than 1,000 miles east of Cape Horn and 2,500 miles southwest of the Cape of Good Hope.



THE AUTHOR'S SKETCH MAP OF THE BLEAK AND LONELY BAY OF ISLES

The coast of this wild South Georgia inlet consists of rocky glacial beaches separated by promontories, and with magnificent glaciers between (see text, page 419).



THE BRIG "DAISY" IN THE ANCHORAGE OF THE "QUEST"

This was the staunch little vessel in which the author made his voyage to South Georgia (see text, page 418). Mt. Paget, in the background, rises to a height of 8,383 feet.

Not a tree was to be seen, nor a shrub even big enough to make a toothpick. The only vegetation . . . was a coarse strong-bladed grass growing in tufts, wild burnet, and a plant like moss which sprung from the rocks."

Referring to his blighted hope of a fair Antarctic land, he added: "To judge of the bulk by the sample, it would not be worth the discovery. . . . Who would have thought that an island of no greater extent than this, situated between the latitude of 54° and 55°, should, in the very height of summer, be in a manner wholly covered, many fathoms deep, with frozen snow?"

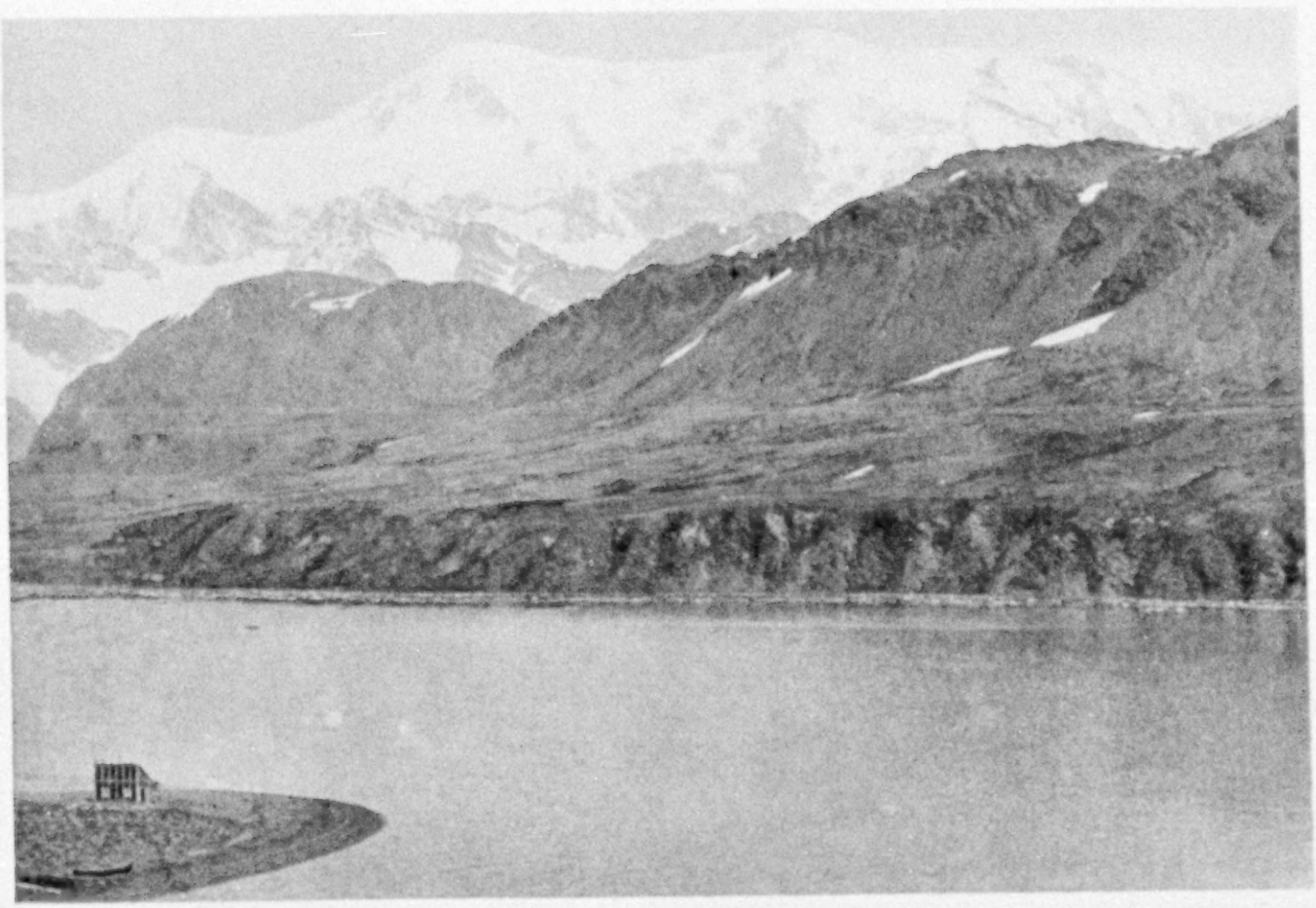
Cook took possession of the country for England and named it the Isle of Georgia; and, after charting the coast, he proceeded on his famous circumnavigation of the world.

"SEA-BEARS" ADDED TO POPULARITY OF SOUTH GEORGIA TALES

Captain Cook's observations on the Isle of Georgia were characteristically thorough. He recorded the depths of some of the inlets and the extent of the tidal rise. He referred to the abundance of seals or "sea-bears," sea-elephants, and penguins. He noted the albatrosses, gulls, "Port Egmont hens," terns, shags, divers, and "blue peterels," which circled over the seas, and the small titlarks of the land. He mentioned that the rocks seemed to be rich in iron. But, most of all, he was impressed with the worthlessness of his landfall and the futility of his search.

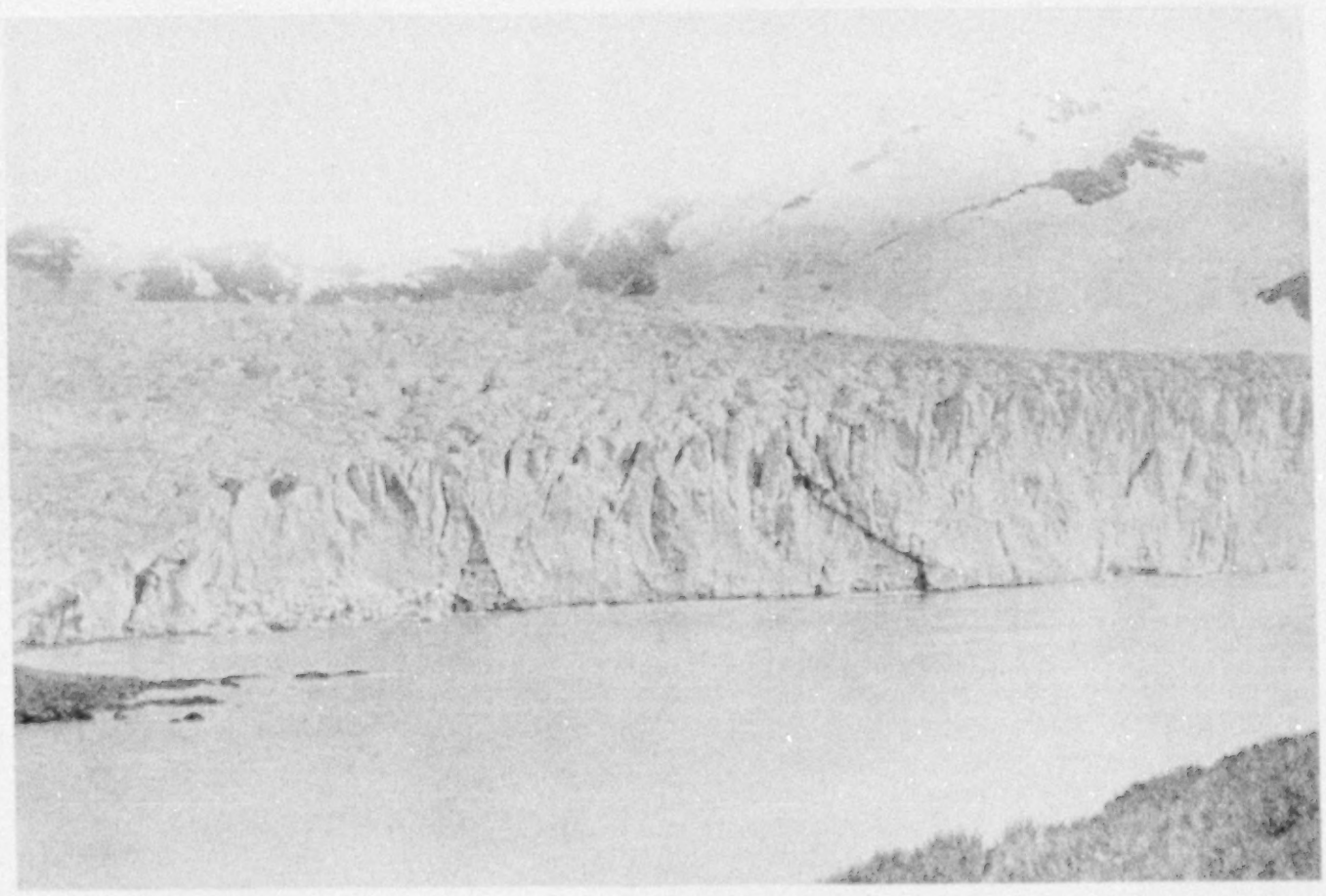
South Georgia, as the island came to be called, was destined not to be forgotten, for the brave tales of Captain Cook were popular reading during the early years of American independence. It may be that his word "sea-bears" was the lure that started the first follower in the wake of the *Resolution*. Certain it is that before the close of the eighteenth century bold Yankee mariners from New London, Stonington, and other Long Island Sound ports had begun to reap the harvest of fur-seal skins at South Georgia.

In the season of 1800-1801 the crews of the fleet killed not less than 112,000 fur-seals. For 20 years the slaughter



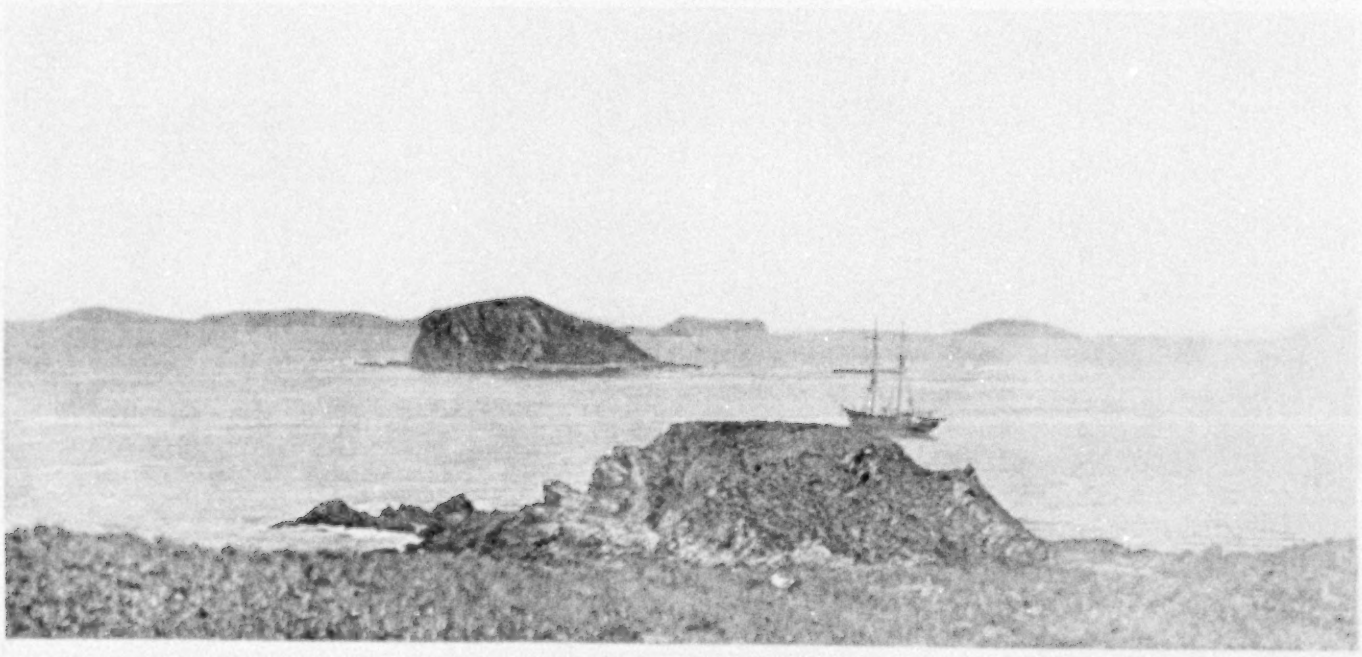
THE ALLARDYCE ALPS, FROM CUMBERLAND BAY

The building on the spit in the foreground is the Argentine Meteorological Observatory.

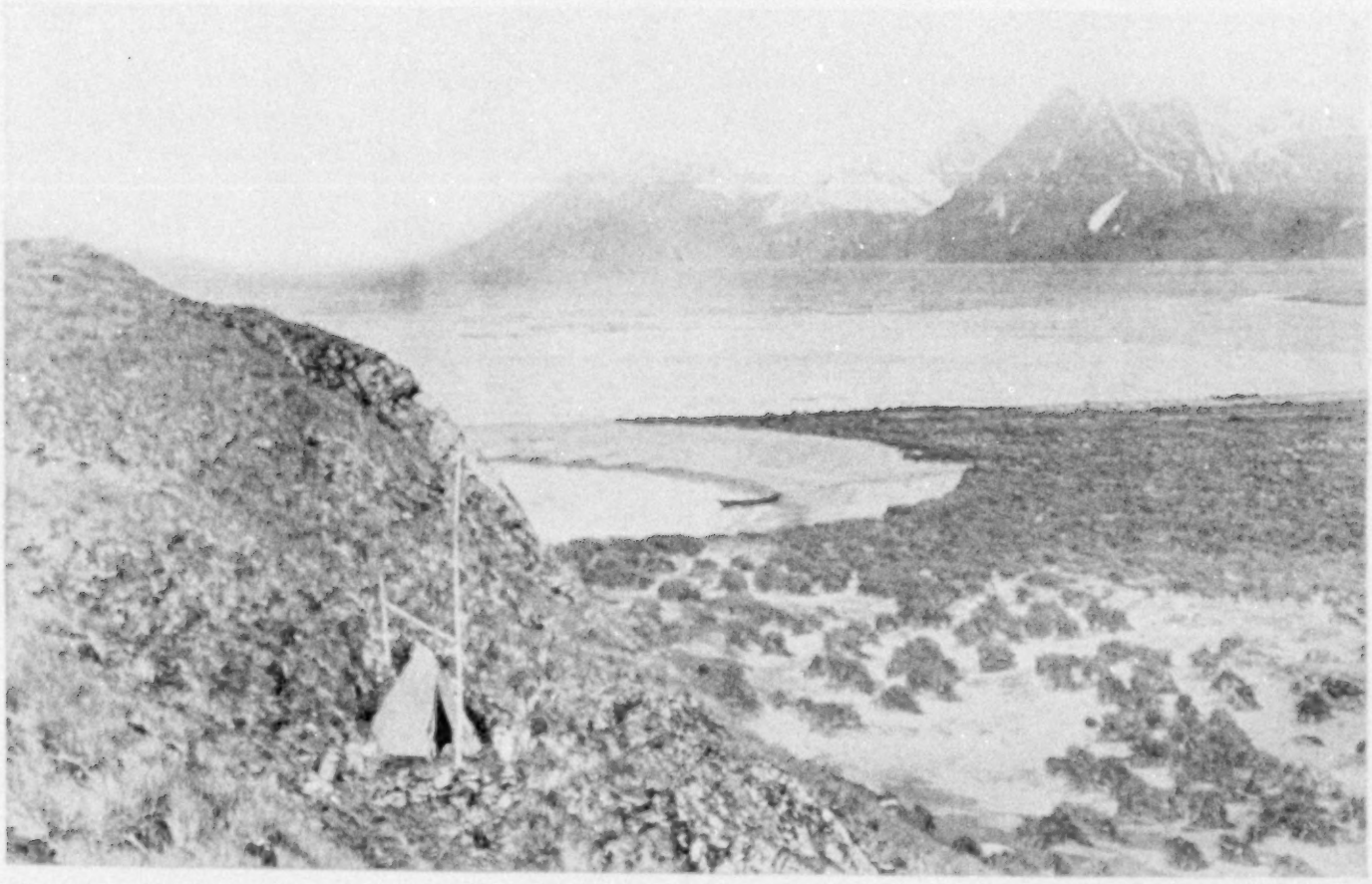


GRACE GLACIER: BAY OF ISLES

The main body of this glacier, whose impassable surface is composed of dazzling pinnacles, in some seasons extends far out into deep water.



THE "DAISY" AT ANCHOR IN THE BAY OF ISLES

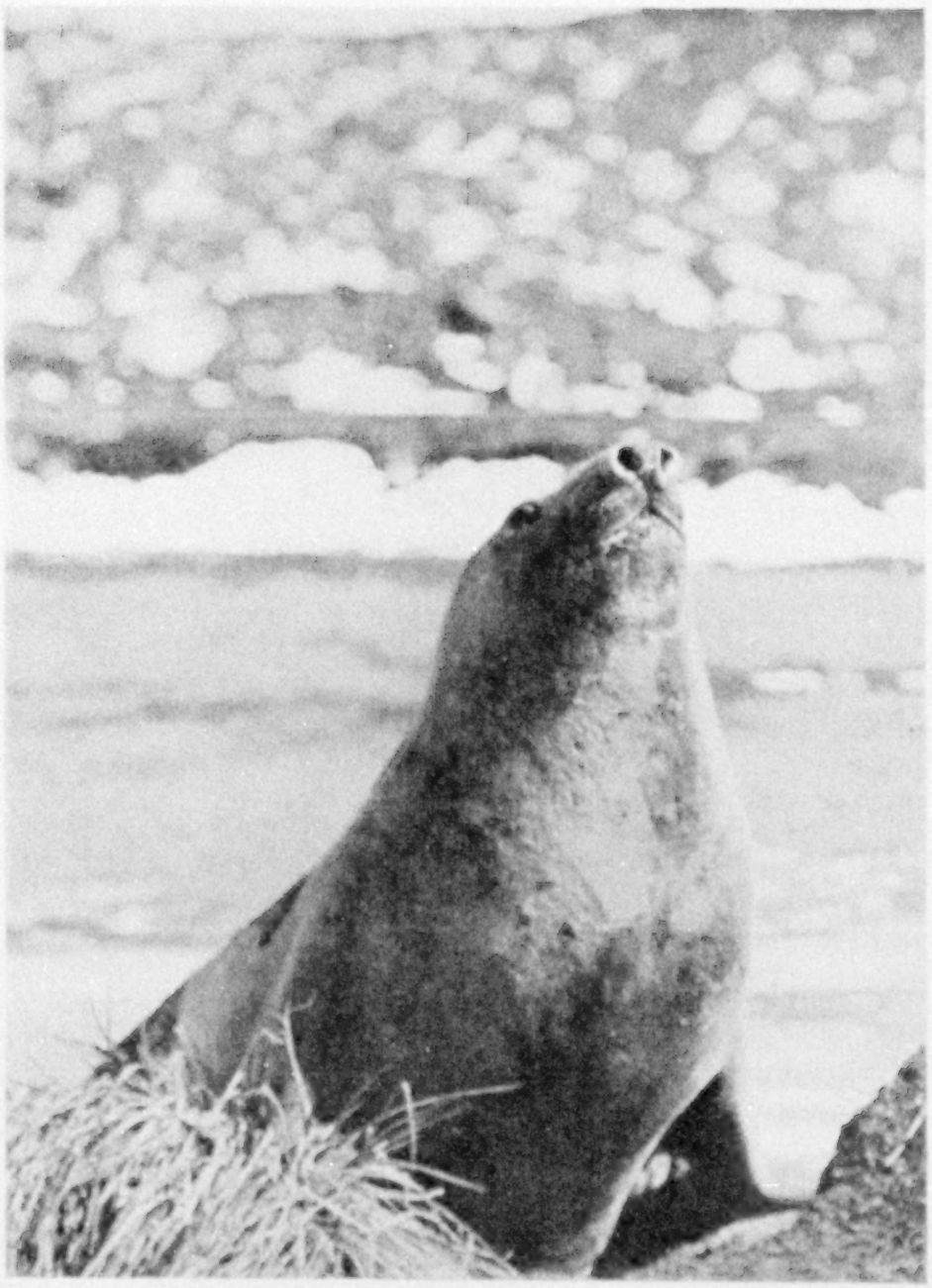


THE AUTHOR'S CAMP AT THE BAY OF ISLES: SOUTH GEORGIA

The grassy islets from which the bay derives its name furnish nesting places for myriads of ocean birds, chief of which are the wandering albatrosses.

continued, and then there were no fur-seals left. A respite of several decades gave the unfortunate animals a chance partly to replete their numbers, when the extermination was resumed and carried to completion. In 1874-1875 about 200 skins were taken, and a few more in 1892. Between 300 and 400 fur-seals were slain illegally in 1907, since when scarcely an animal of the species has been reported from South Georgia.

When the supply of lucrative fur-seals first began to fail, the other amphibious monsters mentioned by Cook, the sea-elephants, were forced to pay the costs of the ruthless voyagers. The sea-ele-



A SEA-ELEPHANT GOING DOWN A BANK

These creatures, despite their ungainly movements on land, are able to bob along on a level surface faster than a man can walk.

phant is the largest of seals, and is thickly invested with blubber which yields an oil little inferior to the product of the sperm whale; hence, "elephant hunting" became an important industry at most of the sub-Antarctic islands. In many of its haunts the species was soon exterminated, and, although at South Georgia it still persists, its days are numbered unless absolute protection be soon enforced.

THE WORLD'S GREATEST WHALE FISHERY

But the tale of human industry at the barren isle is not yet told, and the latest development already overshadows a century of sealing. Eighteen years ago Norwegian seafarers, Vikings still, found a field unspoiled by the bloody dynasty of their American predecessors, and they have made South Georgia the headquarters of the greatest whale fishery on earth.

Between 1910 and 1920 more than forty thousand whales, representing a value of roughly fifty millions of dollars, have been shot on the offshore banks and towed to the bustling whaling stations of the island. In a single year (season of 1915-1916) the South Georgian catch numbered 5,510 whales.

During the earlier years of whaling, the humpback was the mainstay of the industry, constituting more than 96 per cent of the catch; the finback whale next rose to importance as the humpbacks declined; and, finally, the blue whale has become the principal "fish."

This sequence corresponds with the order of size of the three species, the humpbacks being 50 feet in length or less, the finbacks reaching 85 feet, and the blue whales approaching, and sometimes exceeding, 100 feet. In 1917-18 the proportionate numbers of the three species taken was as follows: humpback, 2.5 per cent; finback, 29.3 per cent; blue whale, 68.2 per cent.*

WHALES FURNISHED OIL FOR WORLD WAR EXPLOSIVES

Soon after the outbreak of the World War the British Minister of Munitions appointed an official to take charge of

*Report of the Interdepartmental Committee on Research and Development in the Dependencies of the Falkland Islands, 1920, p. 8.

matters pertaining to the production and utilization of all oils containing glycerin. Attention was then drawn to the fact that the oils of whalebone whales, particularly the humpback and fin whales, are so rich in glycerin that the substance could be profitably extracted for use in the manufacture of explosives.

At the same time it became apparent that the British Government controlled, by right of territorial possession, practically the whole of the shore whale fishery in the Far South, including the catch of stations at South Georgia, a number of the other subantarctic islands, the Falklands, and the coast of the Antarctic Continent west of Weddell Sea.

Many of these whaling stations were operated by Scandinavian or Argentine capital, but by enforcing its undeniable right of making the whaling licenses contingent upon the sale of the oil in British markets, the government succeeded during the war in obtaining something like fifty million gallons of this oil, all of which had a high glycerin content.

A SNAPPING FEMALE OF THE SPECIES

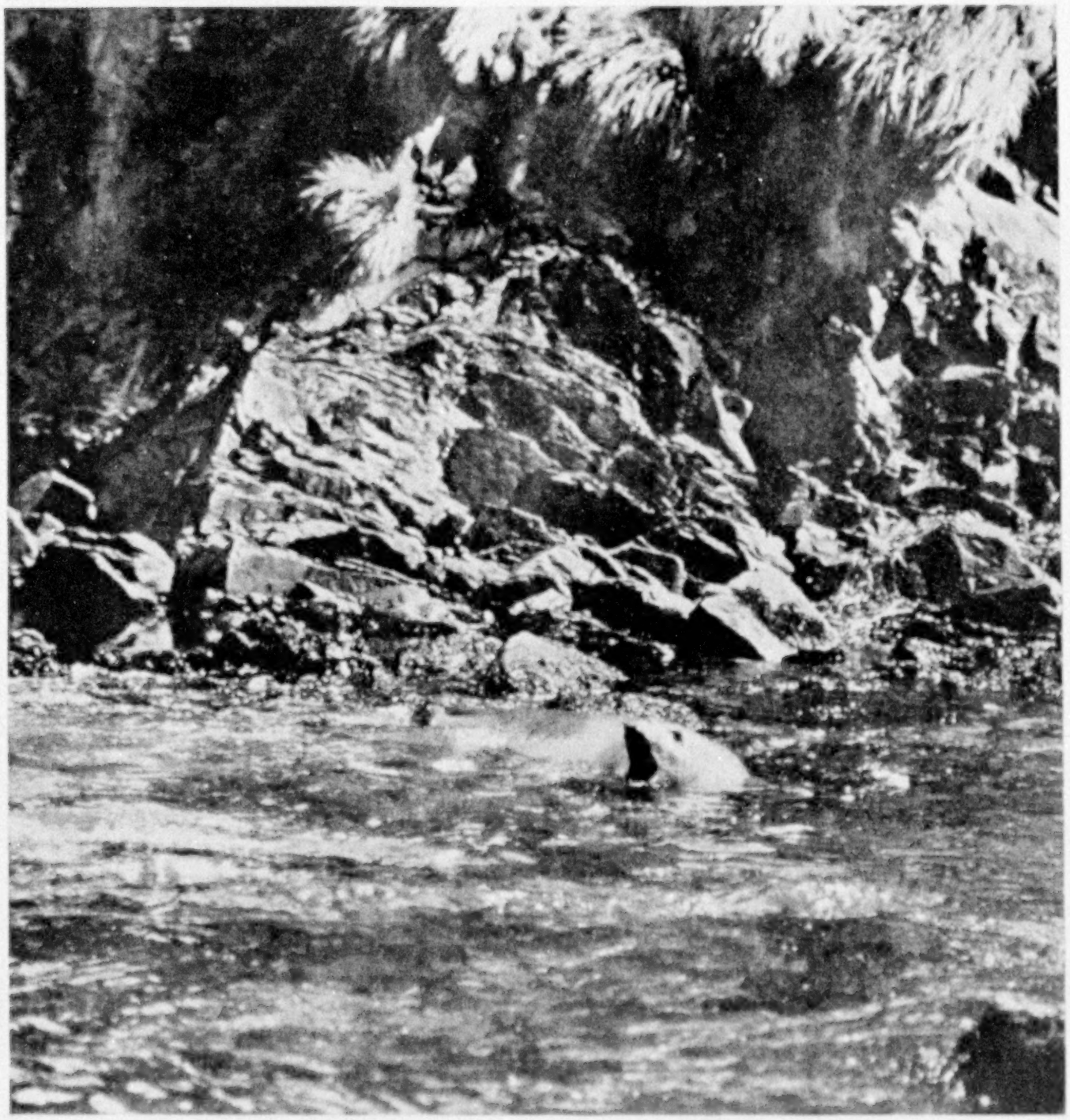
The sea-elephant cows weigh from 600 to 700 pounds and seldom attain a length exceeding nine feet, while the males measure from 18 to 21 feet.

These facts are a sufficient commentary upon the value to a modern nation of out-of-the-way, seemingly worthless land holdings, such as isolated, arid, or ice-covered islands. Great Britain alone, among the great powers, has had the foresight, whether conscious or not, of making good her dominion while there was none to gainsay her.

So much for an epitome of commercial exploitation at a land which one of Captain Cook's associates described as "of less value than the smallest farm in England."

SCIENTIFIC INVESTIGATION ON SOUTH GEORGIA

The history of scientific investigation at South Georgia may be more briefly retold. Following Cook, the Russian explorer Bellingshausen in 1820, the Englishman James Weddell in 1823, and the members of several recent Antarctic expeditions have done much to increase our knowledge of the island; but it is especially to the German *Transit of Venus Expedition* of 1882-1883, the staff of which spent a year at Royal Bay, that



A YOUNG SEA-ELEPHANT TAKING TO THE WATER

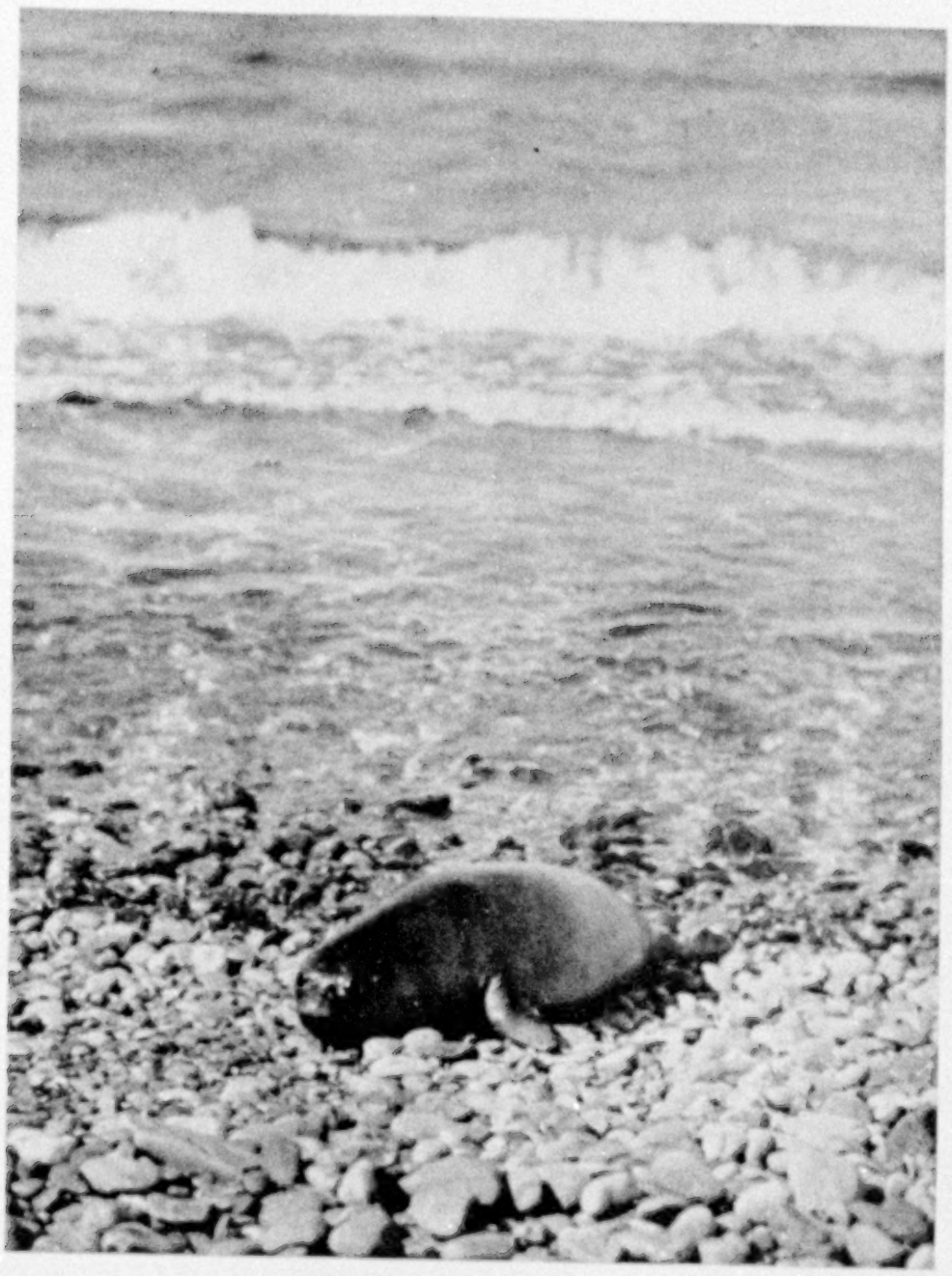
science is indebted for its most important information in the various domains of natural history.

Notwithstanding the researches of the scientific expeditions referred to, and of several individual workers, there remain many fields awaiting study at this subantarctic isle. Like most of the other austral islands, South Georgia has not yet been correctly charted. The altitudes of its mountains are still unknown; only two species of fossils have thus far been unearthed from its hills; we have merely fragmentary records of the life histories of most of its vertebrated animals; the scope of its botany, particularly the cryptogamic botany, has certainly not been exhausted, and the teeming marine life, both plant and animal, is practically a volume with uncut leaves.

My trip to South Georgia was made in the manner of the pioneers, for I was away a full year on the old New Bedford whaling brig *Daisy*, B. D. Cleveland, master. We "made the land" at the middle of the northwest coast late one November, and next day we were towed by a whaling steamer into Cumberland Bay, where the *Daisy* lay at anchor until mid December.

During this visit I enjoyed the unfailing hospitality of the Norwegian ex-

plorer, Capt. C. A. Larsen, founder of the whaling station of the *Compañia Argentina de Pesca*, in King Edward Cove. To the resident British magistrate also, Mr. J. Innes Wilson, whose snug hermitage lay beneath the pyramidal "Duse-fell," on the banks of the cove, I am indebted for many courtesies and for liberal assistance in my work. This gentleman exerted every effort to conserve the wild life of South Georgia, and particularly to prevent the fur-seal tragedy from being duplicated by the extinction of the sea-elephants.



A "PUP" SEA-ELEPHANT TWO OR THREE WEEKS OLD

During November the herds, comprising animals of all ages, spend most of their time sleeping in the tussock grass. Most of them go to sea by the middle of December.

IN THE BAY OF ISLES

From Cumberland Bay the *Daisy* sailed westward to the bleak and lonely Bay of Isles, a hitherto-uncharted cluster of fjords, which were important havens in the old days of the seal fishery. The coast of this wild inlet consists of rocky glacial beaches separated by promontories, which rise in several places to an altitude of about 3,000 feet, and the valleys opening on the beaches are filled with magnificent glaciers, flowing from far inland into the sea (see map, page 412).

A moraine beach between two of the glaciers is famous in the unwritten history of Connecticut sealers as a popular "hauling-up" place for sea-elephants. The grassy islets, from which the bay derives its name, furnish nesting sites for myriads of ocean birds.

Just east of the Bay of Isles is Prince Olaf Harbor, where we found several lonely graves on a tussocky knoll by the sea and a rude, corroded metal sheet, which commemorated the mate and several sailors of the *Sarah Jane*, of New York, who perished so far from home in 1838.

GLACIERS AS MIGHTY AS THOSE OF SPITZBERGEN

The geologic structure of the high and rugged mountains of South Georgia indicates a former connection with the Andean system through a bridge of land now sunk a thousand fathoms beneath the sea.

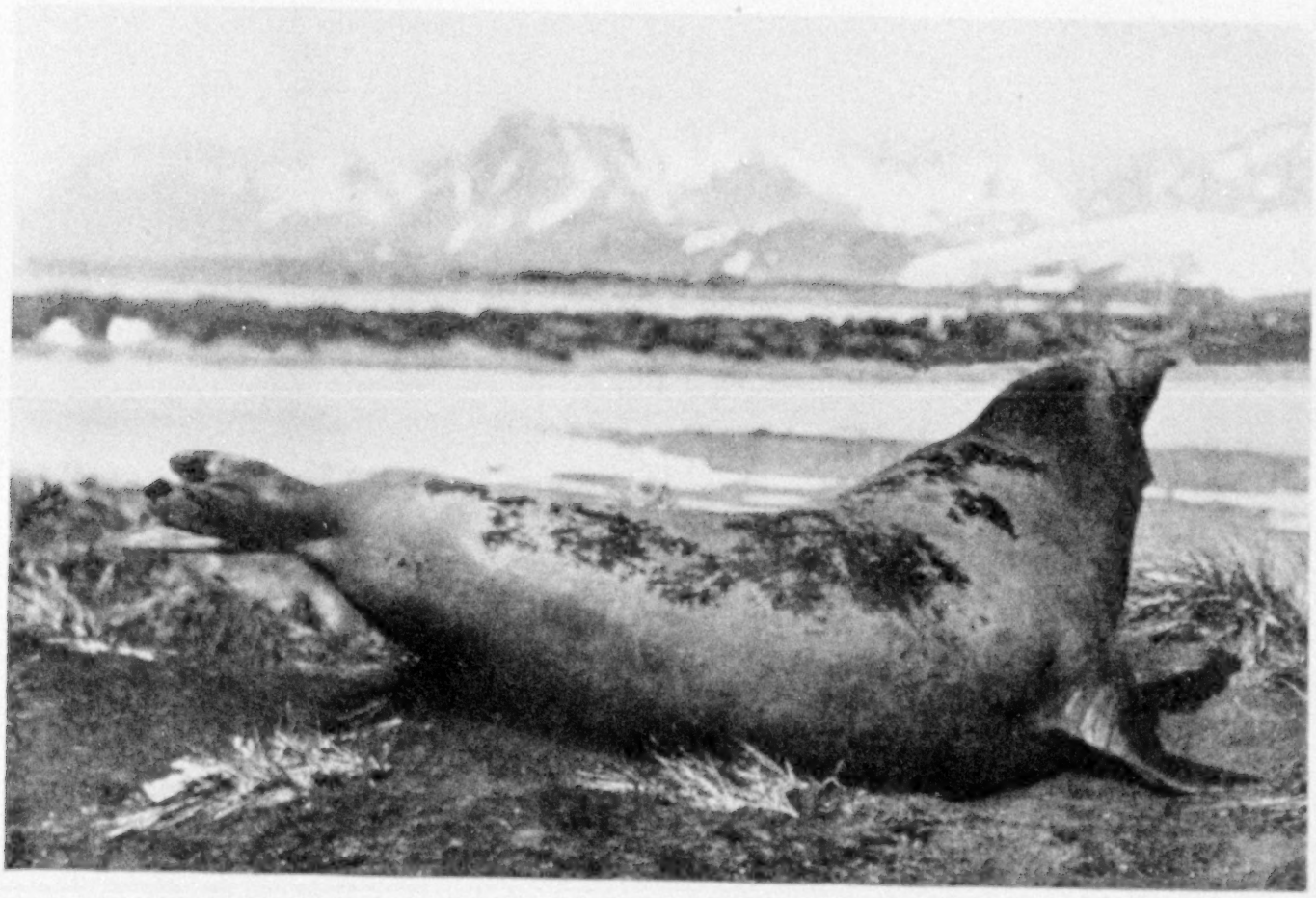
Small though South Georgia is, its glaciers are as mighty as those of Spitzbergen, and there is ample evidence that the

"DEAD TO THE WORLD"

The chief business in the life of the sea-elephant is sleeping. The animal usually lies on its back, with the nostrils tightly closed most of the time. There is no danger of its sleep being mistaken for death, however, for its flippers are moving nervously, now scratching its sides, now its head, and from time to time scooping up mud or sand, which is scattered over the body.

A SEA-ELEPHANT "COW" AND HER "PUP"

The mother is scratching herself, while her offspring gaily waves its hind flippers and the skua gull looks on.



A SEA-ELEPHANT SWINGING COMPLETELY AROUND AFTER BEING AROUSED FROM SLEEP
The animal has faced the sailor who stepped on his hind flippers.

island was formerly completely buried by an ice-cap. The high ground of the interior is covered with an everlasting névé, which consolidates at the sources of all the valleys to form tongues of ice, most of which extend clear into the sea, ending in abrupt walls.

The one incomprehensible statement in Captain Cook's account of South Georgia is his emphatic testimony that he saw no brook or stream along the whole coast. Certainly in our time the rushing torrents are a great impediment to progress on land, and during January thaws gleaming cascades, visible from far at sea, pour from the ledges of the coast hills.

IT RAINS OR SNOWS FIVE DAYS OUT OF EVERY SIX

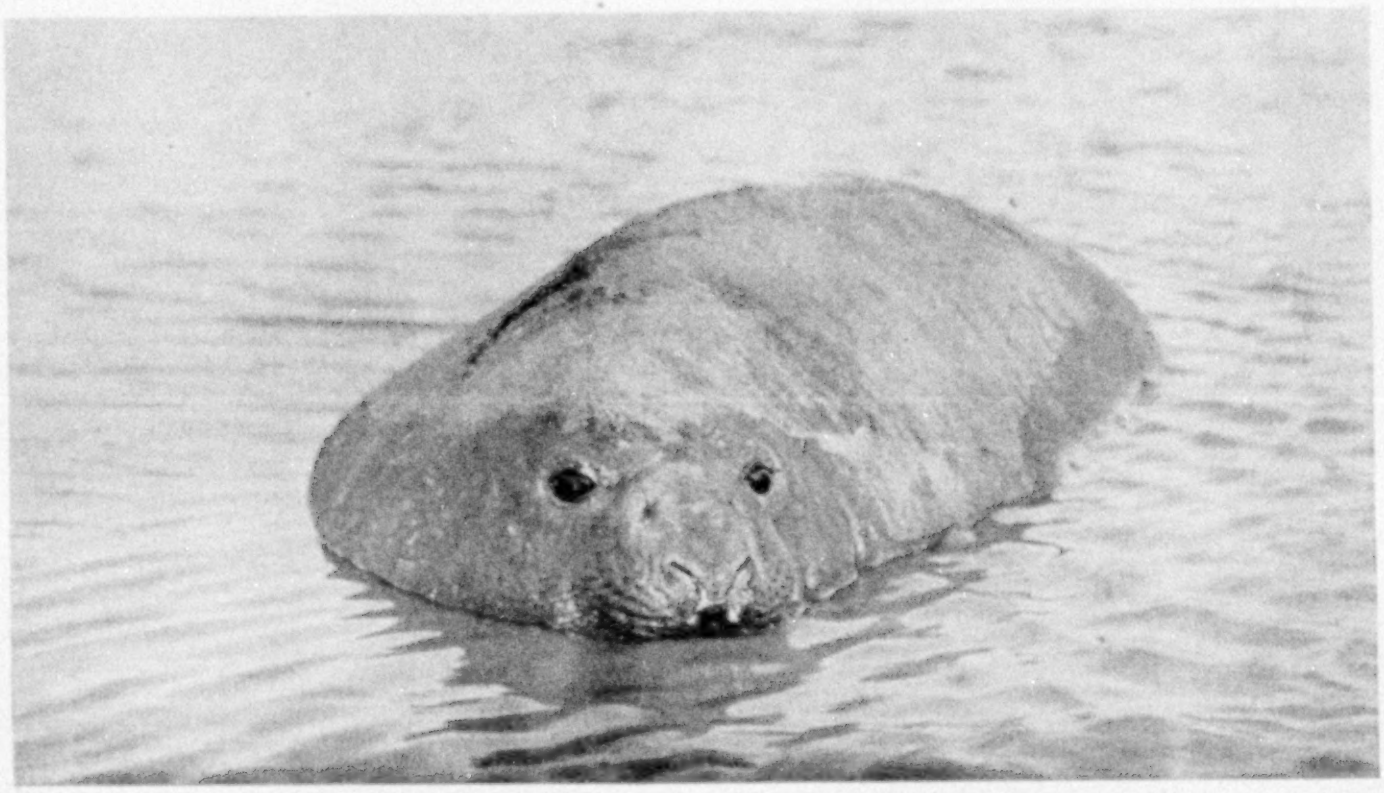
The climate of South Georgia varies relatively little throughout the year. The mean annual temperature is very close to the freezing point, and the sky is prevailingly overclouded. February is the warmest month. Snow, generally in the form of hard, globular particles, which sting the skin like hail, falls in every month, and rain and sleet storms are both frequent and prolonged during the summer. Either rain or snow falls on about five-sixths of the days of the whole year.

The greatest proportion of clear days is in winter; but November and December, the springtime of the southern world, are often made memorable by a few successive days of sunshine, while on rare midsummer afternoons of January and February the jealous Ice King is sometimes lulled to sleep, the thermometer rises as high as 68° F., and South Georgia basks in a sparkling calm. Only on such fleeting occasions is the subtle feeling of the glaciers absent from the land and sea.

There was but one hard frost at sea-level during the summer of my visit, this being at the Bay of Isles on the night of January 13, when a half inch of ice formed on all the fresh-water ponds.

VIOLENT GALES ARISE UNEXPECTEDLY AND SERIOUSLY MENACE NAVIGATION

The prevailing winds are westerly and southwesterly, and since tremendous barometric changes take place very quickly at South Georgia, there is probably no



A SEA-ELEPHANT IN SHALLOW WATER

place on earth where violent gales arise more unexpectedly or blow with more terrific force. A sustained total force of 38.5 miles per hour has been recorded in April at the comparatively sheltered observatory in Cumberland Bay, while the velocity of the maximum gusts has been estimated at 140 miles.

Time and again during our visit the *Daisy's* anchors were heaved up from 15 fathoms by hours of toil, only to have a gale spring up unannounced, so that the chains could hardly be loosed quickly enough to renew the moorings.

The light, doldrum airs of South Georgia fjords are equally treacherous. I have seen the wind shift its direction 90 degrees in the course of 10 minutes, and one could never tell when a furious puff would whistle through a mountain pass and tear up watery sheets from the surface of the bay at the imminent risk of driving our helpless whale-boats into the face of a glacier or onto a rocky islet. Fortunately we came through the whole inclement season with no greater loss than the staving of two boats on the shingle of a lee beach, the crews subsequently spending 18 hours exposed to the fury of the blizzard.

The affinities of the flora are in the main with the South American continent; to a lesser extent with New Zealand and the eastern subantarctic islands. The plant life presents a transition stage between the Falkland or the north Fuegian type and that of the Antarctic mainland.

FEW PLANTS ON SOUTH GEORGIA

The most abundant and conspicuous plant is the virile tussock grass (*Poa flabellata*), which covers much of the lower ground and straggles up the hills on favorable northern exposures to a height of nearly 1,000 feet.

The individual plants of the tussock grass form high, circular pedestals or hummocks. The stalks attain a length of over four feet, and, according to Prof. Carl Skottsberg, a single hummock may flourish for a quarter of a century or more. The other grasses of South Georgia are inconspicuous.

The extreme paucity of this treeless, shrubless vegetation may be well realized by comparing South Georgia with regions in high northern latitudes. Labrador, at the corresponding parallel, has magnificent forests. Saltdalen, Norway, north of the Arctic Circle, boasts not only luxuriant timber land, but thriving fields of hay and barley as well; and Melville Land, in 75° north latitude, 1,400 miles nearer the Pole than South Georgia, has about 70 species of flowering plants as against the latter isle's 15.

A BULL SEA-ELEPHANT AND A NEW BEDFORD SEALER

The man is preparing to kill the animal with his lance.

The respective conditions are explained in a general way by Darwin as follows: "On the northern continent the winter is rendered excessively cold by the radiation from a large area of land into a clear sky, nor is it moderated by the warmth-bringing currents of the sea; the short summer, on the other hand, is hot. In the Southern Ocean the winter is not so excessively cold, but the summer is far less hot, for the clouded sky seldom allows the sun to warm the ocean, itself a bad absorbent of heat; and hence the mean temperature of the year, which regulates the zone of perpetually congealed undersoil, is low."

AN "OCEANIC" CLIMATE

South Georgia has an *oceanic*, as opposed to a *continental*, climate; it is under the continual equalizing influence of the sea, and it thoroughly demonstrates how much more unfavorable to the production of a varied flora is a constantly low temperature than seasonal cold of the severest kind.

As stated previously, South Georgia has been completely glaciated during some period of its history, and there is no probability that any of the higher plants have existed there from pre-Glacial times. Their introduction, by wind, drift, or birds, must have been since the last ice period, and if we allow for the addition of two species in each thousand years we have sufficient time for the natural transportation of the present phanerogams (flowering plants).

To consider a speculative example, the fruits of *Acæna adscendens* (Captain Cook's "wild burnet") are hooked, so that the seeds may have been carried great distances by ocean birds, or by seals which often sleep in growths of this plant.

Owing to the same oceanic life conditions, the land animals of South Georgia are even fewer than the plants. There is no indigenous terrestrial mammal, but rats, horses, and reindeer have been introduced and are thriving in a wild state. The rats were probably first brought by sealing vessels a hundred years ago.

TITLARK ONLY LAND BIRD PECULIAR TO ISLAND

There is a single species of land bird, a titlark (*Anthus antarcticus*), peculiar to the island. Iceland, on the threshold of

THE FULL-MOON COUNTENANCE OF A YOUNG BULL SEA-ELEPHANT

The necks and breasts of these ungainly looking beasts are covered with an armor of hide an inch thick. They are a contentious tribe, many of the older animals bearing scars extending through the blubber layers on the shoulders as reminders of mating-season battles.

the Arctic, is inhabited by more than 20 species of land birds, yet South Georgia, in the possession of its lone titlark, is richer than the Crozets or Kerguelen Land or any of the other snow-covered austral islands. Twenty-three species of breeding water birds and three species of seals complete the list of native vertebrates which spend part of their existence on land. An earthworm (*Acanthrodilus*) is common, and there are several forms of rock spiders, a mite (*Bdella*), and a tick infesting some of the birds.

The insects comprise parasitic fleas; small beetles of the genus *Hydromedion*, closely related to our "meal-worm" beetles; large sluggish flies, which breed in damp seaweed along the drift line; minute wingless flies; ephemeral May-flies, which swarm over the tussock grass after thaws; and acrobatic "springtails," or Collembola.

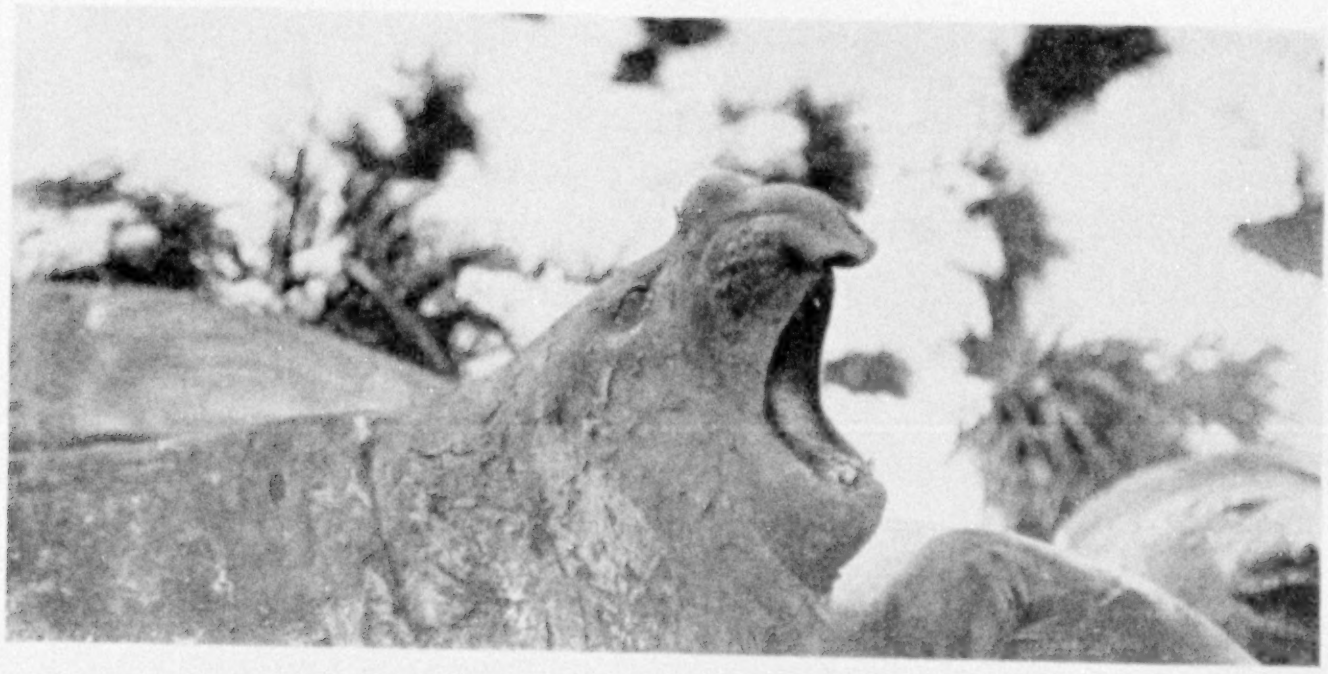
The springtails (*Isotoma*) swarm by inconceivable millions in the dark, loose, vegetal mold among the tussock stalks. I used to collect them by placing a saucer of alcohol on the soil, and the marvelous little skippers, leaping pell-mell hundreds of times the length of their tiny bodies, would shower down invisibly into the saucer as if they were spontaneous creations of the atmosphere.

A TEEMING MARINE LIFE

The abundance of the marine life is in marked contrast to the scanty terrestrial fauna and flora. Red, green, and brown algæ, starfishes and sea-cucumbers, jelly-fishes, shells, squids, and innumerable crustaceans thickly people the fjords.

Pelagic shrimps, upon which the whales and penguins feed, travel in dense shoals, while close along shore the giant kelp, that longest of sea plants, harbors among its 50-fathom branches an aggregation of living creatures more varied and abundant than any inhabiting forests of the upper world.

When the ocean is calm and the sun peeps through the clouds, sending a shaft of light down into the green obscurity of the bays, the water may be seen to be literally filled with minute transparent things, which constitute the so-called



A ROARING SEA-ELEPHANT

The war-cry of this animal is a curious strangled bellow. Even in his sleep he is noisy, for he continually emits gasps and tremulous wheezes, as if afflicted with nightmare.

plankton. There are no fresh-water fishes at South Georgia. The marine fishes are represented by only a few species, but these are exceedingly abundant.

MAKING THE ACQUAINTANCE OF SEA-ELEPHANTS

Within a few days after our arrival at South Georgia we made the acquaintance of the sea-elephants. The young, known to sealers as "pups," had been born about two months earlier in the year. The mating season of the adults had followed, and during November herds comprising animals of all ages lay, sleeping and fasting, in the tussock grass until they were ready to go to sea again, which most of them did by the middle of December.

The patriarchal bulls, whose unwieldy bulk and long snouts have given the species its common name, were rather scarce in the vicinity of Cumberland Bay, but hundreds of huge carcasses, stripped of blubber and rotting on the beaches, were constant tokens of their abundance in former years.

Shortly after New Year sea-elephants, rejuvenated and fattened by active sea life and a diet of fish and squid, began to return to the land, congregating in summer colonies behind the open beaches. The females came first, the large bulls mostly staying in the sea until February. During the latter part of February, 18-foot bulls came out on the beaches frequently, and on the last day of the month we killed a gigantic brute which measured, from snout to hind flippers, 21 feet 4 inches, or almost twice as much as a walrus.

Female sea-elephants are relatively small, seldom exceeding a length of 9 feet and a weight of 600 or 700 pounds. They lack altogether the long snout of the male, the face of an adult female rather resembling that of a pug dog.

SEA-ELEPHANTS ARE "BORN FIGHTERS"

Sea-elephants have contentious dispositions and are given to fighting among themselves from earliest puphood, yet fondness for company is one of their marked traits. An animal coming out of the sea is obviously not contented on a lonely shore. It wanders about nervously between brief resting periods and soon returns to the water, perhaps feeling that it *must* find some one to quarrel with.

A sea-elephant, when landing, crawls slowly up the strand, stopping to let the waves break over it, and taking advantage of every swell to aid its progress. When it has reached the upper beach it rises to its full height and reconnoiters; then, proceeding a little farther, it repeats the action; or, if it spies none of its kind, it may take a siesta before continuing the search.

The large, wind-swept moraine beach in the Bay of Isles was a favorite place

FERAL HORSES OF CUMBERLAND BAY

These are the offspring of animals left on South Georgia by a German Antarctic Expedition. There are no indigenous terrestrial mammals on the island.

for sea-elephants of all sizes to "haul up." The western end of this beach, below the site of my camp, was covered with hummocks of tussock grass and a dense growth of "Kerguelen tea" (*Acæna*), the other three-quarters being a stretch of fine shingle, nearly bare of vegetation and inclosing four ponds, or chains of ponds, which were fed by some of the innumerable glacial streams that cross it.

During December about 250 sea-elephants were summering on various parts of this beach, and even after the sealers had sent these the sad way of their forefathers, whose bones lay scattered far and wide, others came up from time to time.

When we first arrived groups of the animals were occupying three different types of lairs, namely, the depressions or troughs between the tussock hummocks, grassy places on the banks of the streams and fresh-water ponds, and pockets of stagnant, fluid mud around the edges of the terminal moraine behind the beach-plain. Each cluster of sea-elephants lay as closely together as possible during the daytime, and all the lairs had a strong swinish smell.

The younger animals of the groups near the ponds entered the water more or less and indulged in many fights there; those in the mud-holes lay engulfed to the eyes and seemed to wallow thus for days at a time. At night all were noisiest and most active, some roving about, for in the morning I often found their broad tracks winding across the pebbly plain and sometimes leading a mile from the bay.

SEA-ELEPHANTS ON LAND MOVE LIKE INCH-WORMS

On a level surface sea-elephants can bob along faster than a man can walk, but pauses for rest are made at short intervals. Their mode of progression has been well likened to that of an inch-worm, yet when in a hurry they arch the spine and jerk forward the pectoral flippers with such rapidity that their resulting gait might almost be called a gallop.

ONE OF THE CREW OF THE "DAISY" DIGGING OUT SPECIMENS OF PETRELS

It is laughable to see a fat adult bounce along at full speed, with head jerking up and down and ponderous blubbery sides shaking. The hind flippers are, of course, not employed for travel on land, but are merely trailed.

Although going up hill is necessarily a slow and painful process for sea-elephants, they are nevertheless ambitious in that feat, especially on parts of the coast where the best growths of tussock grass are on hillocks near the shore. Not infrequently we found herds of the animals on the summits of promontories 70 or 80 feet above the sea, and in one instance much higher, atop a perpendicular cliff, which they had surmounted from the rear by clambering up an adjacent valley.

Later the seal hunters visited this place, and I was told that a stampeded cow had dashed over the brink of the cliff, falling more than 100 feet to the beach below, yet she scurried right into the sea and swam away vigorously.

When in the water, sea-elephants remain submerged most of the time, progressing by means of wide, sculling sweeps of the hind flippers, the blades of either limb working simultaneously. It is astonishing to see with what ease their huge bodies glide through the dense thickets of the giant kelp. I suspect that they capture a part of their food among the tangles of the kelp, for I sometimes found small rubbery pieces of the seaweed in their stomachs.

SLEEPING IS THE MAIN BUSINESS OF LIFE

Sleeping seems to be the main business of sea-elephants during the summer months. They sometimes take naps in the coves and ponds, either at the surface, with round backs just awash, or else down near the bottom, where they maintain a perfect hydrostatic balance. Ashore they sleep most of the time, usually lying belly up, and they often refrain from breathing for considerable periods by keeping the nostrils tightly closed, just as though they were under water. Still more often they make use of one nostril only, spreading and closing it with each breath, while the other remains shut all the time.

A sea-elephant's sleep is suggestive of nightmare or a guilty conscience. The inspirations of the breath are irregular gasps, the expirations tremulous wheezes. The body shakes violently from time to time, and the fore flippers are ever nerv-

A SOUTH GEORGIA TERN STANDING ABOVE ITS SINGLE EGG

The eggs and young of gulls and terns on the island are protected by obliterative coloration.

ously moving about, now scratching the sides, now the head, which is inclined downward until within their reach; next they may be crossed over the breast in order that one flipper may be scratched by the other.

The fingers of the fore flippers are very flexible, bending when employed in scratching quite like human fingers. The hind flippers are now and then spread fanlike and brandished in the air, or rubbed and clasped together like a pair of clumsy hands. Awake or asleep, they are fond of flinging sand or mud over themselves by scooping the earth backward with the palmar surface of the fore flippers.

All these motions often go on while the brutes are in such total oblivion that it is difficult to awaken them. I have tossed a handful of sand into the wide-open nostrils of a restless, sleeping bull, throwing it into a fit of coughing, yet it did not even open its eyes. In December a group of nine half-grown bulls, which I was careful not to alarm, lay sleeping beside a stream near my tent, and I believe none of them moved so much as its own length during 10 days, although they roused up for pugilistic encounters once in awhile and made considerable noise.

A fight between two old "beachmasters" is a sight to remember. The huge beasts rear up on their bellies to a height of eight or nine feet and hurl themselves forward, ripping each other's thick-skinned necks with their heavy canine teeth and emitting their curious strangled bellow between the clashes. They are well protected by a breastplate of hide an inch thick; but I have seen many bulls with old scars which extended clear through the blubber layer on the shoulders, and we killed one big animal which had lost a large portion of its snout.

BIRD LIFE A FASCINATING STUDY

The two dozen species of birds which breed on South Georgia offer a fascinating field for the study of certain biological questions, notably the struggle for existence. The titlark, the only land bird, has already been mentioned. The remaining birds belong to six distinct groups, as follows:

1. Three species of penguins, of which one is rare.

A PAIR OF SOUTH GEORGIA TEAL IN THE TUSSOCK GRASS

2. Thirteen species of *Tubinares*, the group comprising petrels, fulmars, albatrosses, etc.

3. One shag, belonging to a widely distributed Antarctic branch of the cormorant family.

4. A teal and a goose, the latter having been introduced from the Falklands by man.

5. A skua, a sea-gull, and a tern.

6. *Chionis*, the sheath-bill, an aberrant member of the snipe and plover family.

As would appear from this list, the Tubinares are far and away the dominant sea-birds of the Southern Hemisphere. In their evolution they have adapted themselves wonderfully to every life condition, and the existing species show wide differences in external structure, as well as the unusual range in size illustrated by a comparison of the Mother Carey's chickens with the wandering albatross.

The titlark, sheath-bill, teal, and goose of South Georgia are wholly or in part vegetable feeders. The cormorant and the tern eat fish. The gull subsists chiefly on limpets and other shell-bearing mollusks. The penguins and Tubinares capture cuttlefish and pelagic crustaceans, the giant petrel, or "breakbones," alone obtaining part of its food on shore, since it has a relish for carrion. The skua feeds on any kind of animal food, dead or alive, especially upon other birds and their eggs.

A CAPE HEN SUNNING ITSELF IN FRONT OF ITS BURROWED NEST ABOVE THE SEA

"The colonies of the subterranean breeders furnish most of the music of South Georgia, for at night the incubating birds pipe up in a tinkling chorus which often can be heard far out over the fjords" (see text, page 432).

This rapacious bird, the skua, well named *Megalestris*, or the "big pirate ship," is a fair subject for a whole volume on faunal relationships. To all effects, the skua is a sea-gull which has turned into a buzzard-hawk. Along with its supposed change of habits it has assumed a hawk-like plumage, a heavy carnivorous bill, and long, sharp claws. It is the enemy of every living creature it can master, and it is probably responsible for a greater destruction of bird life at South Georgia than any other agency.

One wonders indeed, on seeing the variety and abundance of the skuas' food supply, why these birds do not increase indefinitely and overrun the island even more than they do at present. An answer is found in the fact that they sometimes eat their own offspring, and perhaps this is Nature's strange method of maintaining her balance.

Whatever liberties the skuas themselves may take with their progeny, they are averse to allowing any other creature within a couple of hundred yards of their nest. Often while walking unconcernedly over the tundra of the coast hills I have been savagely attacked by a pair of these birds, which fly at one's head with such force that they sometimes kill themselves by striking against a stick or gunbarrel raised up in defense.

If warded off for a while they will alight on the ground near by, raise their white-banded wings straight up over their backs and hold them there while they scream lustily at the intruder. When I first saw the skuas in this beautiful pose I realized at once that the upright wings on the helmets of the old Norse heroes were copied from the wings of kindred spirits, the skuas of Iceland and Scandinavia.

SKUAS WATCH FOR HOURS FOR A CHANCE TO STEAL

About the penguin rookeries skuas squat on their bellies hour after hour waiting patiently for a chance to steal an egg or chick. I sometimes made good use of them by allowing them to trim the

A GIANT PETREL DEFENDING ITS YOUNG

This bird protects itself and its chick by throwing the unsavory contents of its crop at an intruder.

meat and fat off the penguin skins I had collected. Once I had 35 skuas hard at work at one time. They fought continually, even when there was room for all, and one or two old champions usually monopolized each skin.

In fighting they raised their wings and jumped at each other like game cocks, except that they did not employ their claws. They knocked each other down in jolly fashion and pulled out tufts of feathers, the battle being half on the ground and half in air. The victor always raised his wings and screamed before returning to the banquet and driving off the birds which had slipped into his place while he was engaged.

If one bird flew away with a scrap of meat in order to devour it elsewhere, the others would suspect that he had a superior morsel, and immediately the whole pack would leave its plenteous repast and follow the fugitive, who was sure to be robbed unless he could contrive to gulp down his billful as he flew. When once a skua's capacious maw was filled, it would draw back a little, squat on the ground, and allow its rapid digestion to fit it for another meal.

In spite of their cruel and wanton dispositions, the skuas have a spirit of *bon camaraderie* which makes one love them. They crowd about a man on the beaches and look up with bright, fearless, unsuspicious, brown eyes; pick up the scraps that are thrown to them, and pay no more attention to the loudest shouts, handclaps, or whistles than if they were stone-deaf. When one talks to them in a low voice, however, they cock their heads and listen with an interest which is whimsical to see.

FIVE METHODS OF DEFENSE AGAINST SKUAS

With so powerful a foe as the skua, it is obvious that all other South Georgia birds must have some definite method of

A BLUE-EYED SHAG ON ITS NEST

The shag belongs to a widely distributed Antarctic branch of the cormorant family. The courtship of the shags goes on while the nest is building. Standing cheek to cheek, they bow their heads and twist their necks; then the male bird launches off on a short ecstatic flight and returns to resume the love dance.

defense during the breeding season. In the course of my observations I came to recognize five distinct methods, one or more of which is adhered to by each species.

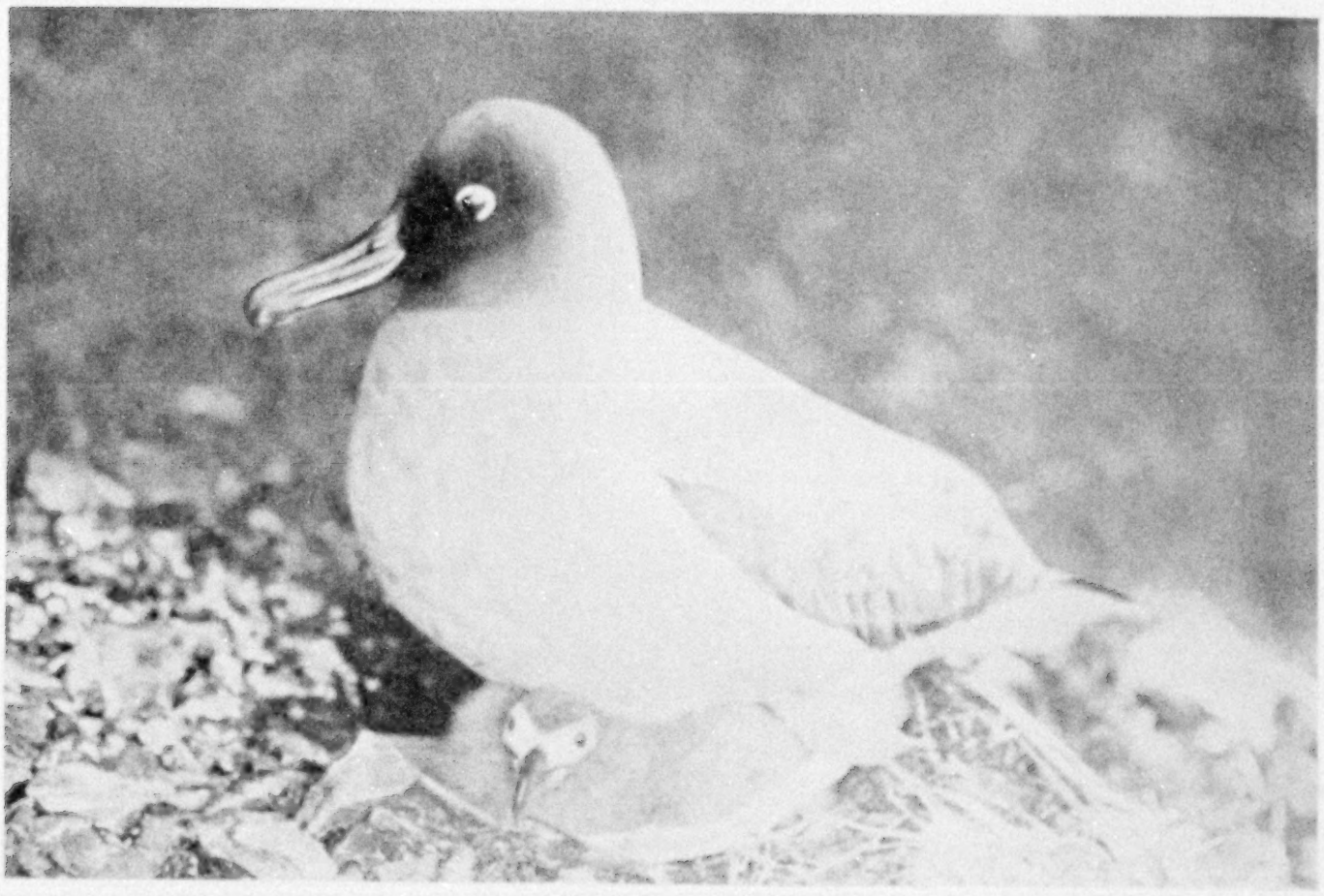
The penguins, albatrosses, giant petrel, shag, kelp gull, and tern all nest in the open, but these birds are singly, or at any rate in pairs, more than a match for the skua. The eggs and young of the gull and tern are additionally protected by their obliterative coloration. Concealment of the nest in the thick grass is the defense of the titlark, teal, and goose.

The teal is, moreover, a master at deceit, contriving by feigned lameness to lure enemies from the vicinity of its family, while the young ducklings disappear as if by magic among the tussock hummocks.

The remaining birds render their nests inaccessible by building them in clefts of the rock or in burrows. The sheathbill and the "Cape pigeon" (*Daption*), for instance, are cleft-dwellers; the other species, including whale-birds, divers, and Mother Carey's chickens, are burrowers.

The colonies of subterranean breeders supply most of the music of South Georgia, for at night the incubating birds pipe up in a tinkling chorus which often can be heard far out over the fjords. Some of the smaller species of these burrowers, especially the divers (*Pelecanoides*) and the whale-birds (*Prion*), dare not come out of their holes except under cover of darkness, but the skuas nevertheless succeed in capturing thousands upon thousands of those unfortunates which chance to be a few fatal moments late in getting back from sea in the early dawn.

The ground over a whale-bird colony is always strewn with acres of dismembered bodies of victims. Despite this destruction, however, and despite the fact that these birds lay only a single egg, the whale-bird myriads seen over the neighboring ocean are like the old flights of the passenger pigeon or a plague of locusts. It is a pure case of survival through strength of numbers.



A SOOTY ALBATROSS AND HIS YOUNG ON A LEDGE FAR ABOVE THE SEA

The father albatross seemed to try to calm the chick while it was being photographed. The young bird resembles a nestling vulture (see text, page 435).

A species which protects itself from the skua by concealment of the nest and constant guard of the young after the eggs have hatched is the Falkland upland goose (*Chloëphaga*). This fine bird is *persona non grata* with sheep ranchers in the Falkland Islands simply because it was designed by nature to feed upon grass, and hence is considered an impediment to the fattening of mutton; so it has been outlawed and a bounty placed upon its head.

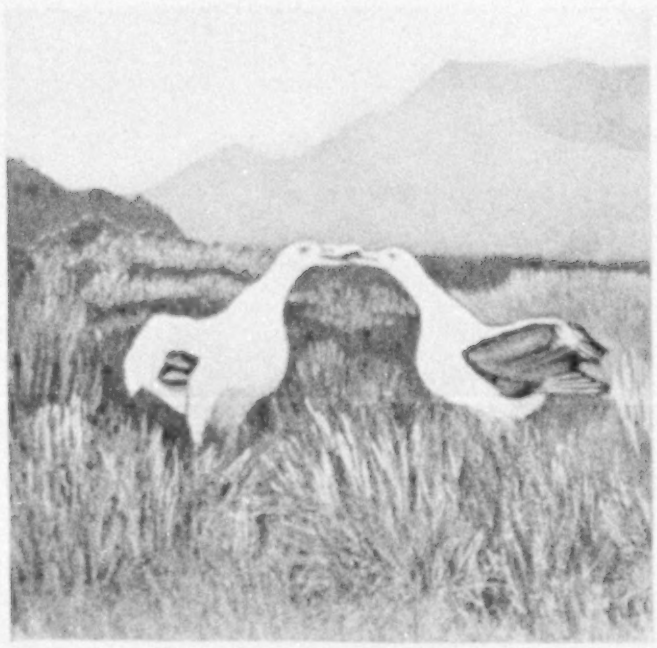
FIVE GOSLINGS RETURNED TO THEIR WAITING PARENTS

Some years ago Mr. Wilson, British magistrate at South Georgia, imported several pairs of upland geese from the Falklands at his own expense, and freed them in the admirably adapted grassy country of Westfjord, Cumberland Bay. The geese have since increased and spread encouragingly, and are there assured of a sheepless future and a home where the species may exist after extermination in its original habitat.

The cabin boy of the *Daisy* one evening came aboard in high glee, bringing me in his pockets five very young goslings which he had captured in one of the Westfjord lakes. Ordinarily I should have been delighted to receive specimens, but in this instance I felt constrained to carry the lively goslings back to their home, and in case the parents did not appear after a time, to attempt to rear them in captivity; but the former experiment was a complete success.

Arriving next morning at the lake, we saw several pairs of upland geese lurking on the far side. One of the goslings peeped, and immediately a guttural clucking came in answer from across the water, and a barred goose began to swim straight toward us, followed at a discreet distance by the snow-white gander.

We put the young brood in the lake, but each gosling attempted to scramble out until it heard the call of the approaching mother, when all five turned their tails and swam bravely away. The parents joyfully received their family again and the flotilla disappeared around a point, with the youngsters well guarded, side by



WANDERING ALBATROSSES COURTING—THE KISS

The wooing of the albatross is one of the curiosities of the bird world (see text below).

side between the goose and her pompous mate.

HOME OF THE ANCIENT MARINER'S BIRD

The great, white, wandering albatross, the bird of the Ancient Mariner, is a true embodiment of the spirit of South Georgia. These splendid creatures nest in large colonies on the islets and grassy promontories in the Bay of Isles. Within a stone's throw of my camp seven pairs carried on their courtship and breeding.

In December many of the dark-colored young of the previous year, with patches of gray down clinging to their plumage feathers, were still lingering about the colonies; but with the advent of a new breeding season these backward youngsters were no longer fed by their parents, so they soon learned to fly and went off to sea.

The wooing of the albatross is one of the marvels of the bird world. An unattached female is commonly besieged by several suitors, whose advances are most amusing, as they throw forward their breasts, stretch out one or both of their great wings, and squeal beseechingly, each trying to confine the female's attention exclusively to himself. Now and then a male will turn upon his rivals, expressing his opinion of them in a gobbling jargon which is doubtless intended to be abusive. They threaten each other, too, with their terrible beaks, but I saw no actual fighting.

For a time the female wisely distributes her favor about equally among the wooers, but when a choice has finally been made the disappointed males walk away, with heads swaying from side to side and hung almost to the ground. They have a diabolical look, like the outwitted villain in a melodrama, and it is easy to imagine that dark and sinister thoughts occupy their minds (see page 435).

PARENT BIRDS DO 10-DAY TURNS OF DUTY ON THE NEST

The nest of the wandering albatross is a large truncated cone of earth and tussock stalks. On this platform the bride sits, with her mate squatting in front of her. They cross their bills, stroke one another's necks, and chatter, making the mandibles vibrate so rapidly that only a blur can be seen. Sometimes they point their bills straight upward and squeal like young pigs. A resonant clap of the bill and an assortment of grunts, gobbles, and caterwauls complete the song repertory.

Now and then the male rises, takes a few stately, deliberate steps, and then poses before his lady with head held high and both wings outspread—12 feet from tip to tip—a come-to-my-arms attitude indeed. This seems to be a sign for the female to come off the nest; the male steps on and takes his mate's place, bowing, and declaring his devotion without cessation.

After the single egg has been laid, one bird goes off to sea, remaining from six to ten days, while the other stays at home without feeding, sleeping much of the time with its head tucked under its wing-coverts. The approach of a skua will cause it to rouse up and snap its beak; but nothing can persuade it to leave the nest, even for an instant, until its mate comes to relieve it. The returned parent has evidently filled up on cuttlefish during its holiday, for in the following period of domestic duties it regurgitates little piles of the indigestible beaks of cuttlefish about the base of the nest.

The division of labor in the albatross family, based doubtless on very ancient principles of equal rights, continues throughout the period of incubation.

In order to launch into flight, the wan-

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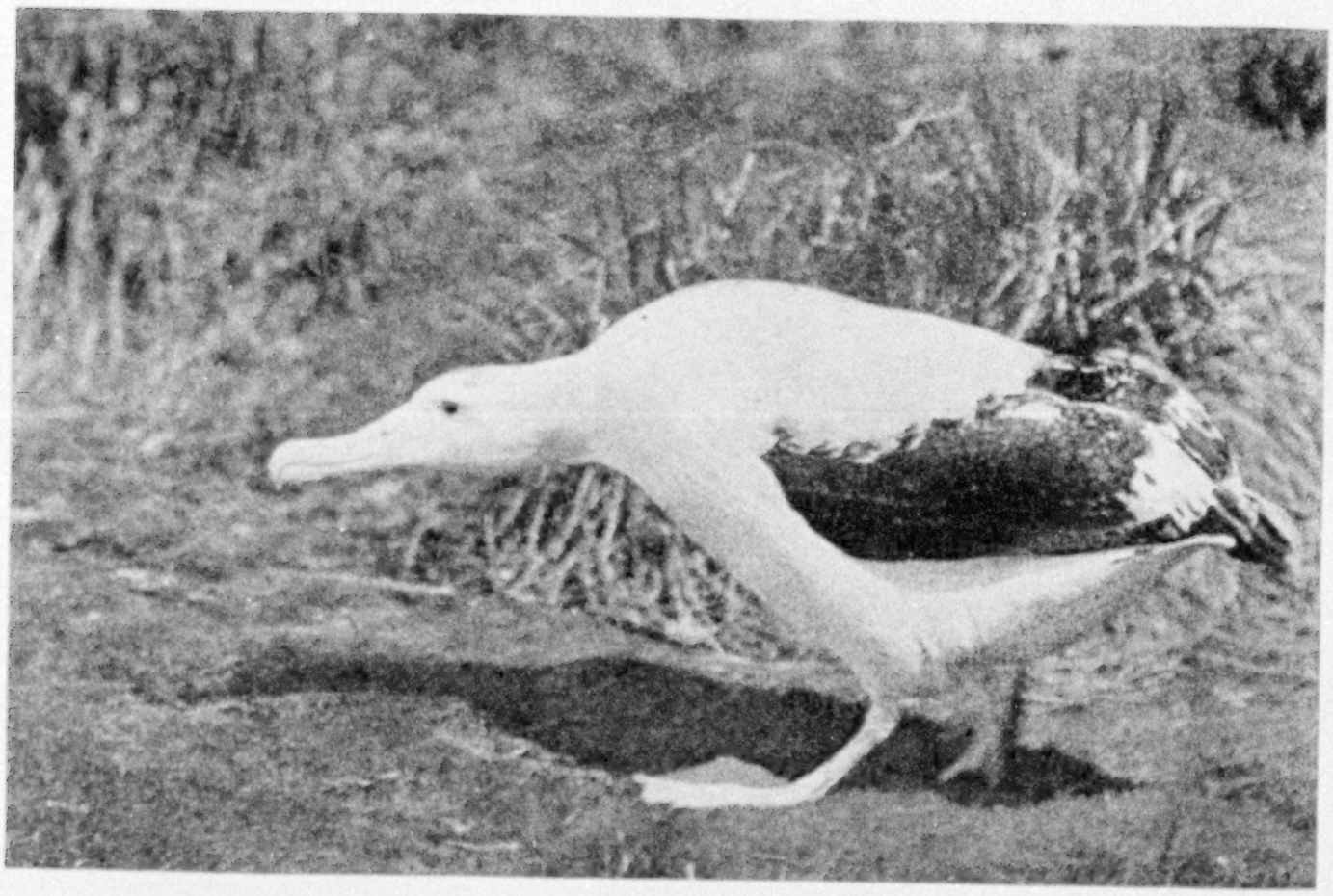


THE DISAPPOINTED SUITOR

After the female bird has made her choice from among several albatross admirers, the rejected swains walk away with heads swaying from side to side and hung almost to the ground. "They have a diabolical look, like the outwitted villain in a melodrama" (see text, page 434).

dering albatross, like its inferior copy, the airplane, must have starting room. The huge bird sets its wings, runs rapidly down a slope, and presently glides off the sluggish earth into its own living element, and then only can its full grandeur be appreciated.

THE SOOTY ALBATROSS IS THE PERFECTION OF GRACE

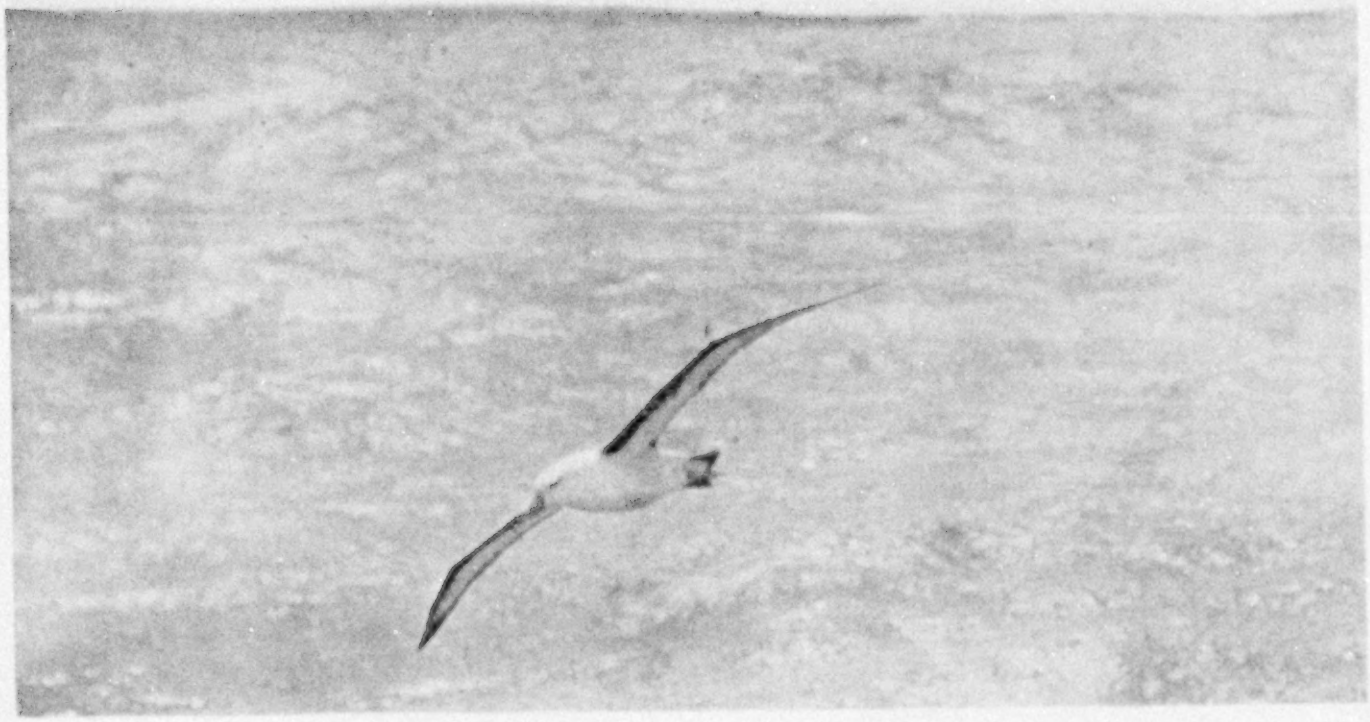
Of different habits is the sooty albatross (*Phœbetria palpebrata*), a dark-colored species which reaches the very pinnacle of perfection in flight, exceeding in grace even its larger relatives.

The sooty albatrosses nest on perilous ledges wherever mountainous headlands rise abruptly from the sea, and while one parent is covering the egg, the other may often be seen sailing, with inspiring, effortless motion, back and forth, back and forth, always passing close to its nest and gazing with a white-ringed eye at its quiet mate.

I saw plenty of nests, crowded against the rough faces of sheer cliffs, as high as 700 feet above the sea, but during nearly four months' search I found only three that a man could possibly have reached. Two of these were in Sea-Leopard Fjord, Bay of Isles. One nest was within 100 feet of the beach; the other about 12 feet above the first, and both sheltered by an overhanging rock wall.

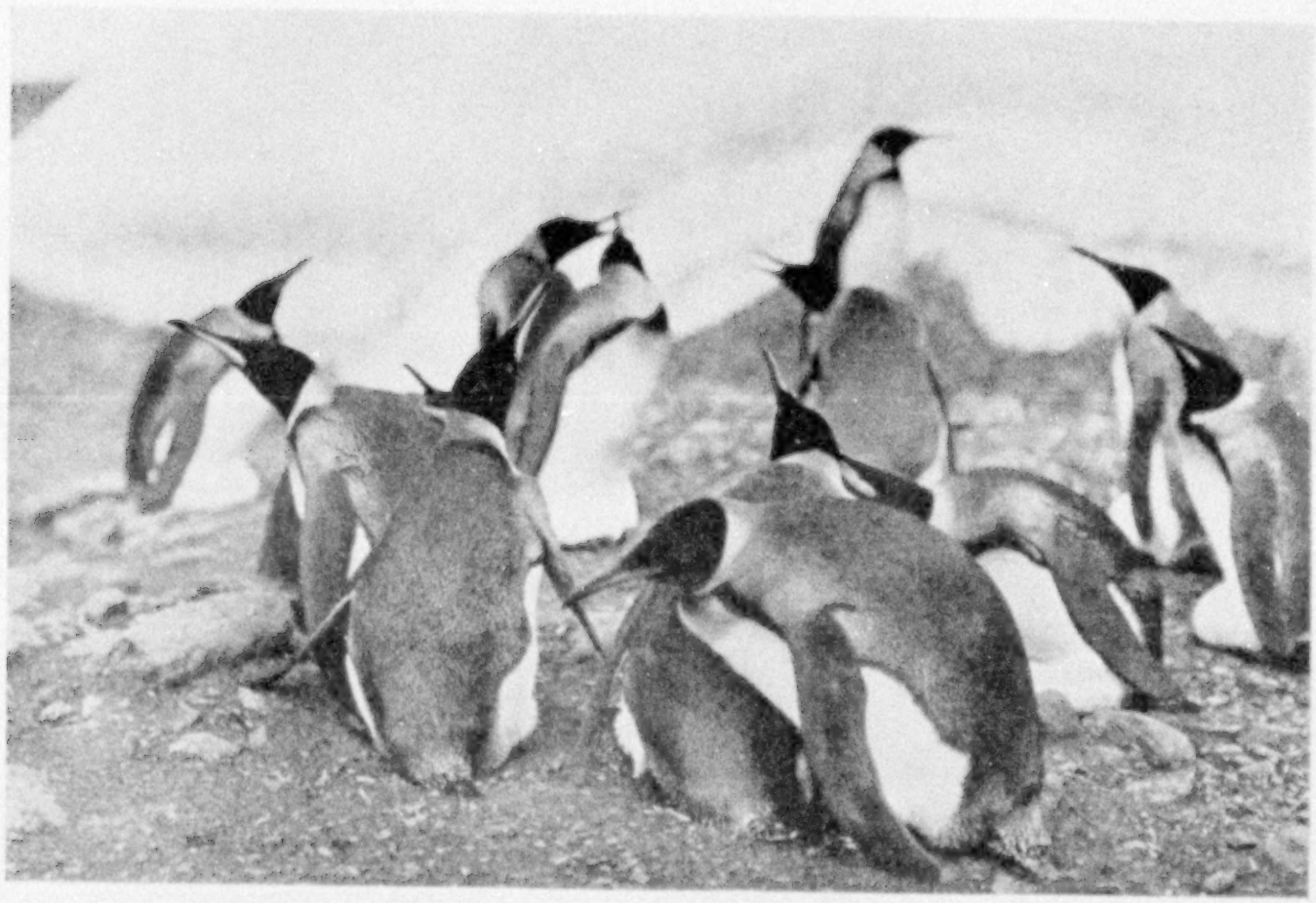
On January 20 I clambered up to the lower site with a camera. The male parent, which was brooding a downy chick, grunted softly and snapped his bill with a hollow chop. He was comparatively trustful, however, and when I had backed away about six feet (as far as the ledge would allow) he snuggled down and began unconcernedly to draw blades of grass through his bill, now and then glancing at me with a solemn, wide-eyed expression caused by his curious, broken, orbital ring (see page 433).

Presently the youngster stuck its head out from beneath its sire. It looked like a nestling vulture because the feathers on the head were very short, while long down covered the rest of its body. It snapped its soft little bill at me just as



A SPECTACLED ALBATROSS GLIDING

TWO SPECTACLED ALBATROSSES CROSSING IN FLIGHT



KING PENGUINS ON THEIR NESTS

"These are the hereditary aristocrats of South Georgia. They wear gold collars around their necks, and on land deport themselves in a lofty and snobbish manner."

the old bird had done. The father albatross seemed to try to calm his baby. He bent over it and kept touching its head with his bill. All his actions showed tenderness and pride; I never saw another bird act quite so much like a human parent.

When I took the youngster out of the nest it immediately crawled back, in spite of its very weak legs. The instinct to lie in one particular spot from birth until flight is possible, is strongly developed in this species. It is easy to understand, on once visiting the sooty's precarious cradle, that natural selection could not fail to weed out all restless, fidgety baby albatrosses, preserving to perpetuate the race only those which are content to lie low and wait.

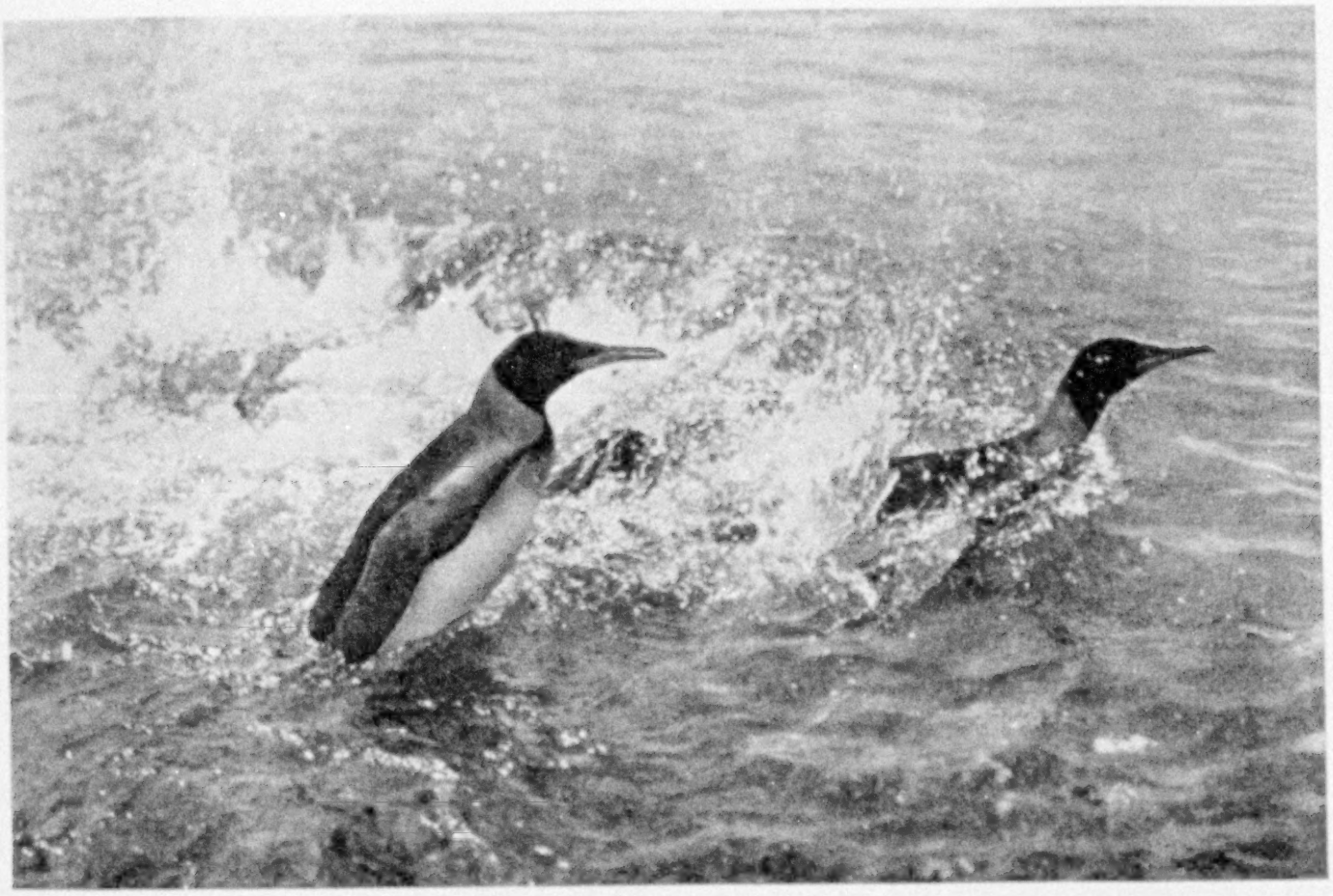
THE COURTSHIP OF THE SHAGS

Down below the eyries of the sooty albatrosses, on the lower ledges of South Georgia cliffs, the blue-eyed shags nest in populous rookeries. They are far more beautiful birds than our northern cormorants, having iridescent blue-green backs and snowy throats and breasts. Moreover, they are better humored; they never threw up the fishy contents of their stomachs at me when I climbed to their nests, or attempted to bite when I stroked their backs.

The courtship of the shags goes on while the nest is building. A pair stand side by side, put their cheeks close together, and bow down their heads and necks. Then, twisting their heads, they put the other cheeks together in the same way and curtsey again. This graceful minuet figure is repeated for some time, and then the male launches off on a short ecstatic flight, from which it returns to resume the love dance.

After the two or three greenish eggs have been laid, the shags are still enraptured lovers, remaining together at the nest much of the time, caressing one another and making low croaking sounds in their throats.

One day I visited a nest just as the eggs were hatching. While I was inspecting a naked, black shaglet hardly out of its shell, both parents stood by with bills



KING PENGUINS TAKING TO THE WATER

These birds have a terrible aquatic enemy in the sea-leopard, a large flesh-eating seal.

parted and throats and mandibles trembling violently, just as when one's teeth chatter. It was an unmistakable demonstration of extreme solicitude. A few days later the nestlings were beginning to sprout their dusky down, and horribly ugly little monsters they were, with black bodies, pink throats, blue bills, and Hottentot tufts all over their turtlish forms. Exactly 49 days after the date of hatching they flew from the nest and began to catch fish for themselves.

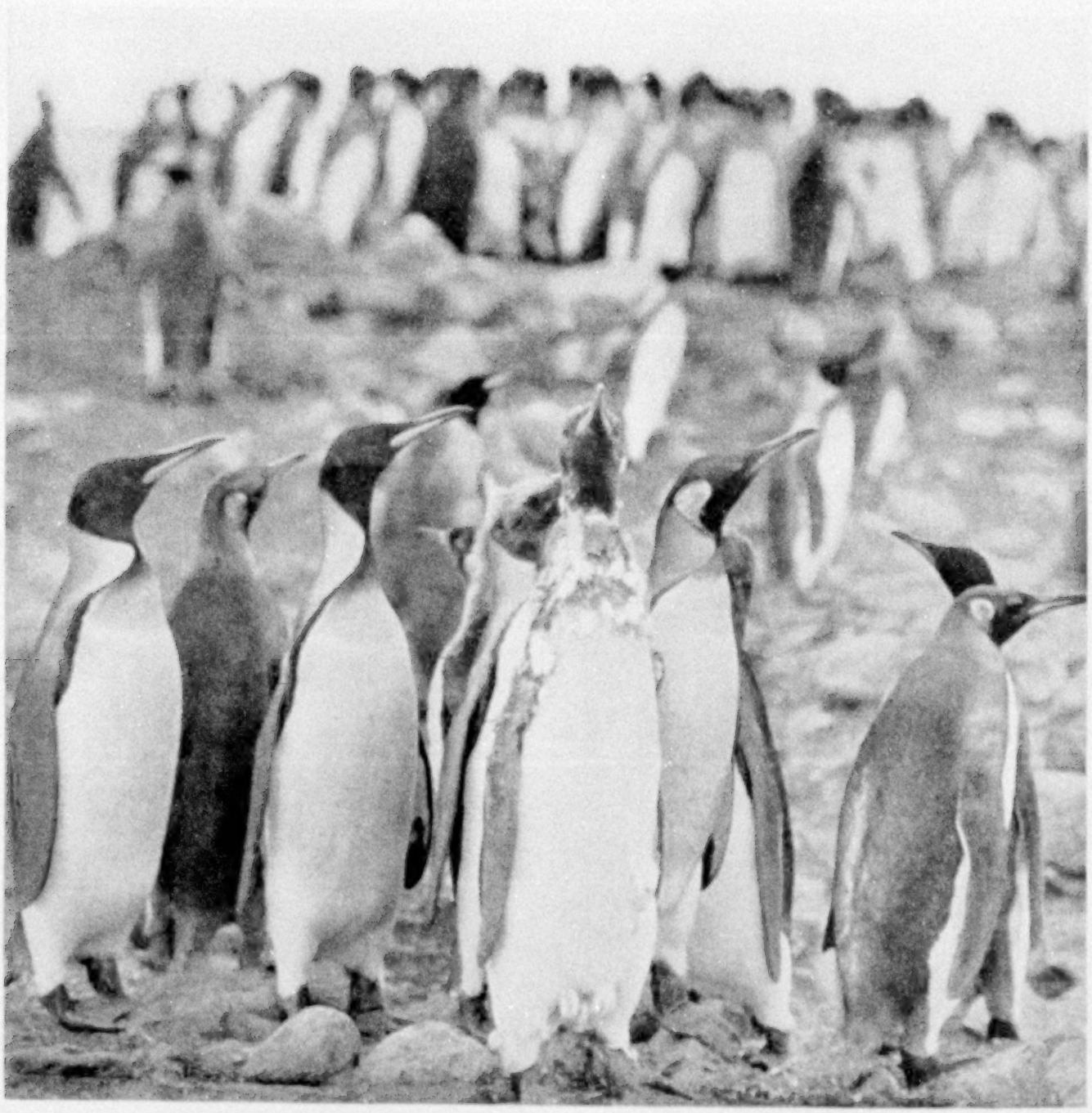
TWO TRIBES OF PENGUINS ON SOUTH GEORGIA

Two species of penguins are still common at South Georgia, although in many of the fjords their numbers have been greatly reduced through the ravages of whalers and sealers, who collect their eggs for eating.

The nobler tribe of penguins, the "kings" (*Aptenodytes patachonica*), form a sort of hereditary aristocracy. They are stalwart birds which stand a yard high. They wear a gold collar round their necks, and deport themselves in a rather lofty and snobbish manner. The members of the lesser tribe, called "Johnnies" (*Pygoscelis papua*), are characterized by short, roly-poly figures, and temperaments which include many attributes of the small boy, among them inquisitiveness, good nature, and a certain degree of quarrelsomeness. The two species follow the same vocation and dwell in the same territory, yet their society is inviolably distinct.

In the December of Antarctic springtime, when the *Daisy* dropped anchor in the Bay of Isles, the Johnny penguins were the first creatures to greet us on the strand. We had met them before in the wide sea some hundreds of miles north of South Georgia; but how different seemed the slippery, reptilian beings, which had thrust their heads out of the dark Atlantic with a braying cry, from these warm, plump little citizens which trudged toward us along the beach, hesitating now and then between curiosity and fear.

The Johnny penguins build bulky nests of stones and vegetable debris and lay two nearly spherical eggs. The eggs usually hatch several days apart, one



THE KING PENGUIN OF "MOTH-EATEN" PLUMAGE IS MOULTING

"After the nesting season is over the adults undergo their annual change of clothes, and for a time they have a very ragged appearance, the old, worn-out feathers coming off in patches, like the hair of a shedding buffalo" (see text, page 440).

chick consequently being much larger than the other during the whole period of growth. Many of the nests I visited contained only one young bird, the skuas having accounted for the other perhaps before it had ceased to be an egg.

When a brooding penguin is driven from its eggs or young nestlings, it lingers near by, trumpeting loudly until the disturbance is over; then it examines the nest very minutely, stooping down over its treasures like a near-sighted person, and scrutinizing one and the other over and over again. When satisfied that all is well it settles down contentedly.

The parents hiss sharply whenever a skua approaches, and sometimes they even rush at one as it stands evilly watching for a nest to be momentarily neglected.

PENGUIN AWKWARDNESS VANISHES IN THE SEA

Strangely enough, the Johnny penguins often locate their colonies on the summits of bare hills long distances from the sea. Every day they trudge back and forth between the nest and feeding ground, along well-worn paths, balancing their upright bodies by thrusting their

KING PENGUIN TUCKING THE EGG INTO ITS "POUCH" AFTER RELIEVING ITS MATE

These birds build no nests, but carry their single egg on top of their feet, covering it with a flap of skin. If a bird is robbed of its egg, it will attempt to mother a stone.

wings backward, and paying no attention to the countless neighbors which they pass on their way.

Once in the ocean, however, all their awkwardness vanishes. They swim with incredible speed, remaining well below the surface except when they leap out porpoise-like, giving an audible gasp for air—to be gone again within the twinkling of an eye.

Their fat bodies seem to be made to stand hard knocks, for not only do they tumble down frequently wherever the walking is rough on shore, but they also suffer fearful batterings on the shingle when they come out of the surf, sometimes being bowled over by four or five successive breakers before they can scramble out of the undertow.

Toward the end of January the young Johnny penguins, fully grown, but still clad in the softest of gray, furry down, permanently desert the nests and congregate by themselves, under the guard of adult nurses. On bright days they herd together on snow-banks and sun themselves; when it is stormy they crouch from the wind in sheltered hollows. They are dependent upon the old birds for their food, which is predigested minced shrimp, until March, for they never enter the water until they have doffed their down and have acquired the adult coat of close scale-like feathers.

After the nesting season is over the adults undergo their annual change of clothes, and for a time they have a very ragged appearance, the old, worn feathers coming off in patches like the hair of a shedding buffalo. The temporary loss of the tail, a luxuriant organ which the Johnny penguin can ill afford to be without, gives them a more dumpy outline than ever.

The penguins have a terrible aquatic enemy in the sea-leopard, a large, flesh-eating seal. From the stomach of a sea-leopard I had shot I once took the remains of four king penguins. On the land, however, these birds have no aggressor save the skua.

FOX TERRIER PLAYS PRANKS ON JOHNNY PENGUINS

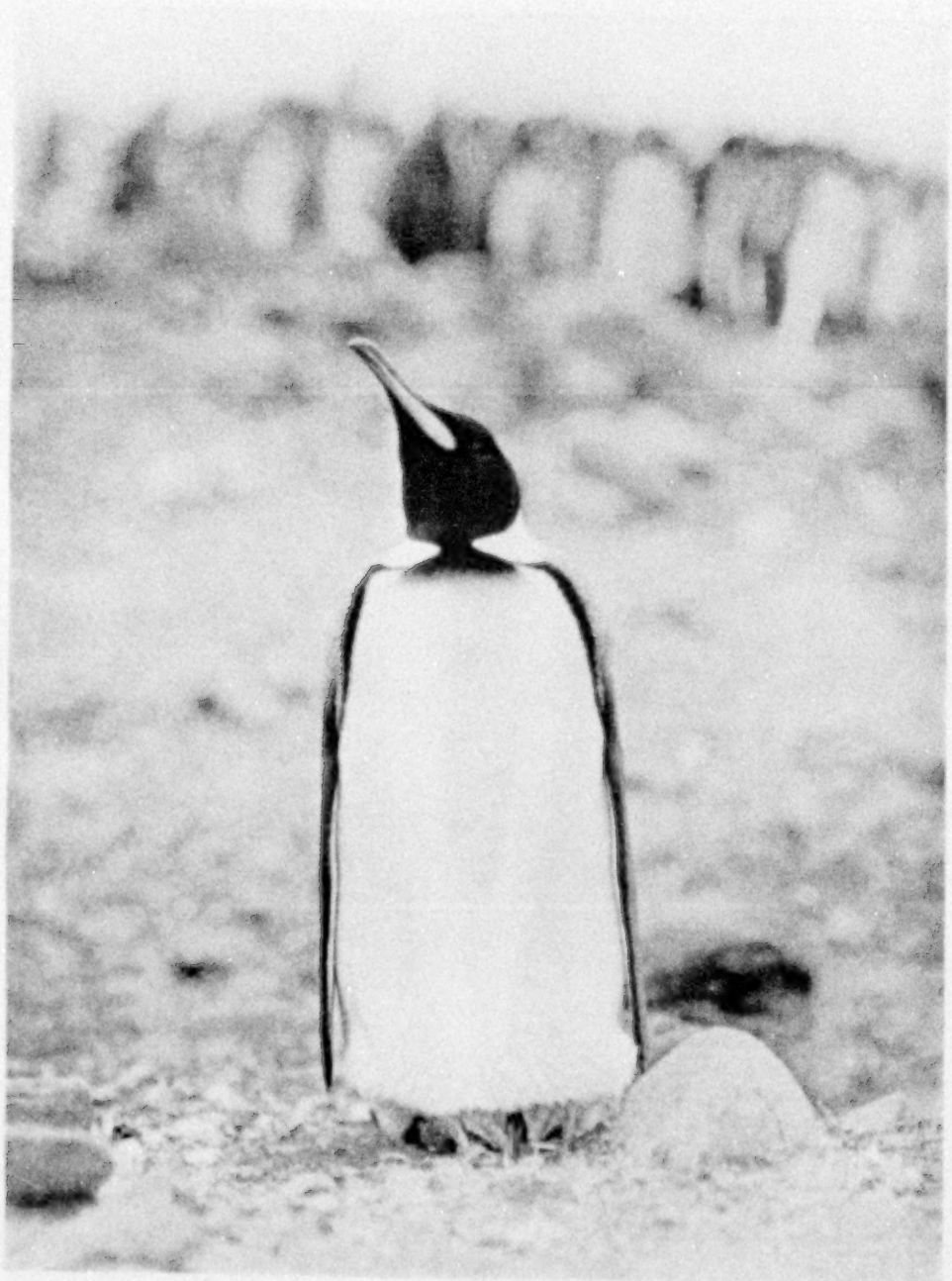
The Johnny penguins showed not the slightest fear of a fox terrier belonging to the *Daisy* until the rascally dog acquired the habit of seizing them by the tails and swinging them round and round merely for the fun of it. After such treatment the poor Johnnies would huddle back to back in a sort of Macedonian phalanx, striking outward with their quick wings at whatever point the terrier attacked them.

The king penguins of South Georgia breed on low ground well back from the salt water. They build no nests, but carry their single egg on top of their feet, covering it with a flap of skin on the lower belly. If a bird is robbed of its egg, it appears quite dumfounded and will perhaps attempt to mother a stone.

The breeding season begins later than that of the Johnny penguins and continues all summer, some birds not laying an egg until March. The sexes alternate about every 24 hours in the duties of incubation. Young king penguins, unlike the young Johnnies, retain their thick down all through the first winter, acquir-

ing their plumage coats and migrating to sea when they are eight or ten months old.

The incubating kings can shuffle along slowly in spite of the egg on their insteps. They are fond of crowding together closely, yet seemingly for no better purpose than to facilitate quarreling. The sitters glare at each other, with sinuous necks twisted and heads cocked sidewise, and deal resounding whacks with their flippers, or lunges with their sharp bills, to all their neighbors. Often whole groups will be engaged in an indiscriminate skirmish with these rapiers and broadswords, and it is a wonder that no harm comes to the eggs.



THE SUPERIOR ATTITUDE OF THE PROSPECTIVE PARENT

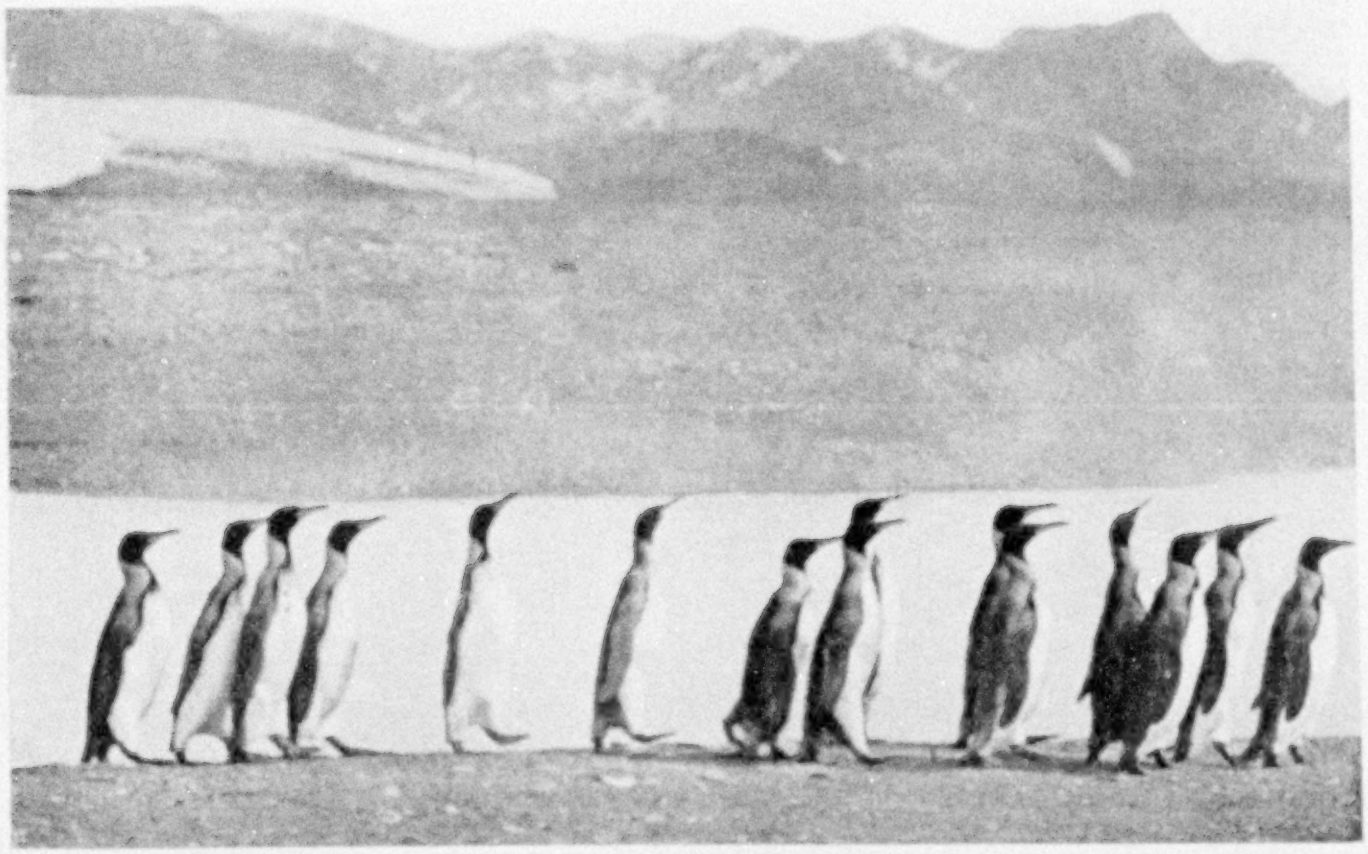
THE KING PENGUIN TRUMPETS LIKE A SOLDIER

A band of king penguins makes a glorious display when the morning sunlight shines on the golden throats and orange ear-patches of the soldierly birds. Sometimes the brigades, scattered here and there over the beaches and moraines, hail and answer each other with long-drawn, martial, bugle calls, and then, as if at a concerted signal, all will start marching toward the sea. Sometimes the birds stand together on the sunny side of a snowdrift, preening their feathers, "marking time," or even performing the difficult stunt of balancing themselves on one foot and scratching their heads with the other.

When a king penguin trumpets, it stretches grandly to its full height, points its bill skyward, and the long volley rings forth from an expanded chest. At the close of the call the head is tilted forward with a jerk and the bird stands at "attention"—a rigid, histrionic pose always held for several moments. The persistence of an ancient instinct is shown in the fact that both the king and Johnny penguins often sleep with their bills behind their "armpits," where ages ago the ancestors of penguins may have had warm wing-coverts.

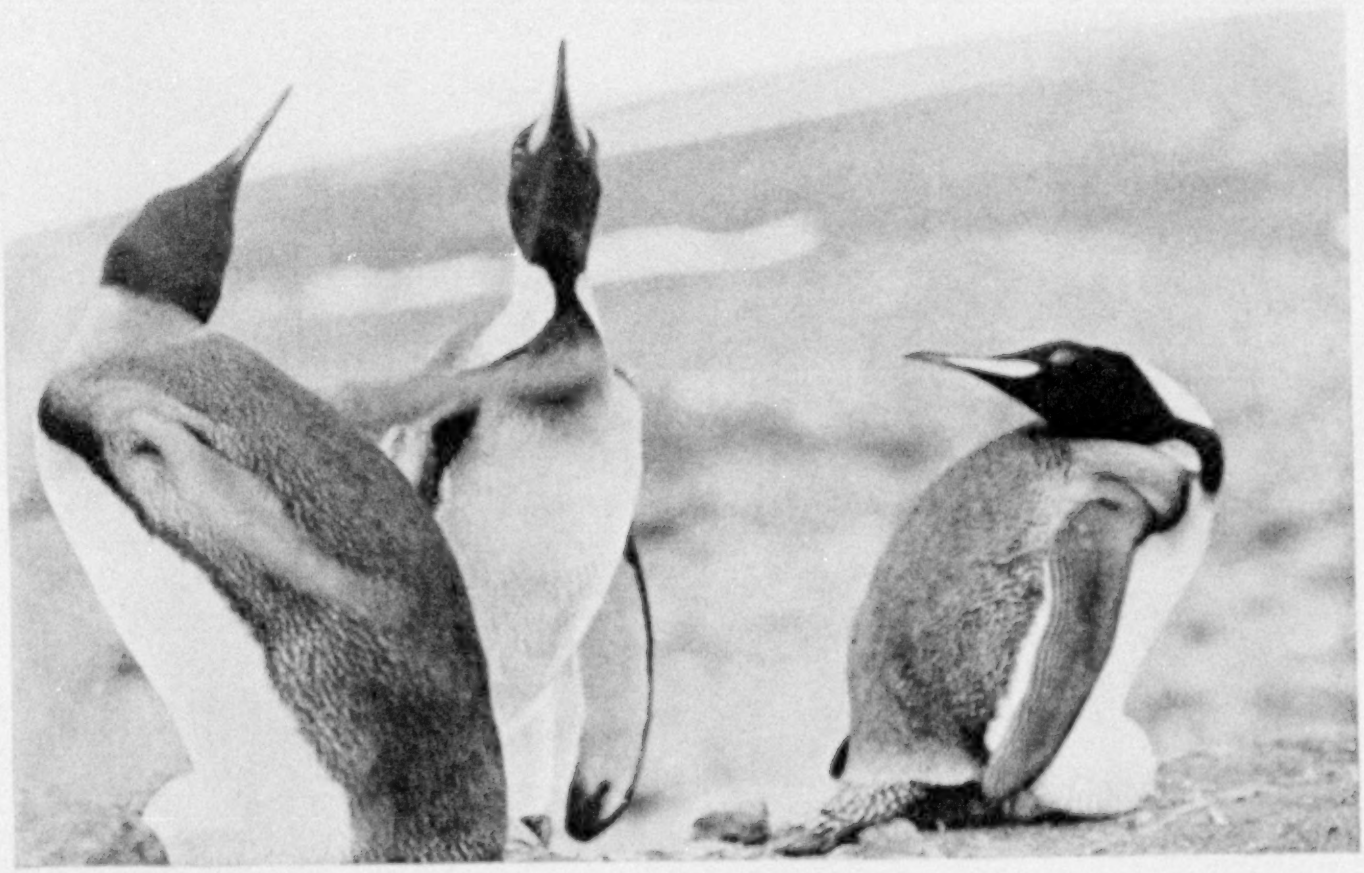
HEADING HOMEWARD

The study of life in a new, strange phase made the weeks pass quickly at South Georgia. The gales and the snow and sleet came day after day, with only an occasional burst of sunshine, but each morning saw a new unfolding in the life histories of remarkable animals, many of which will soon have disappeared from



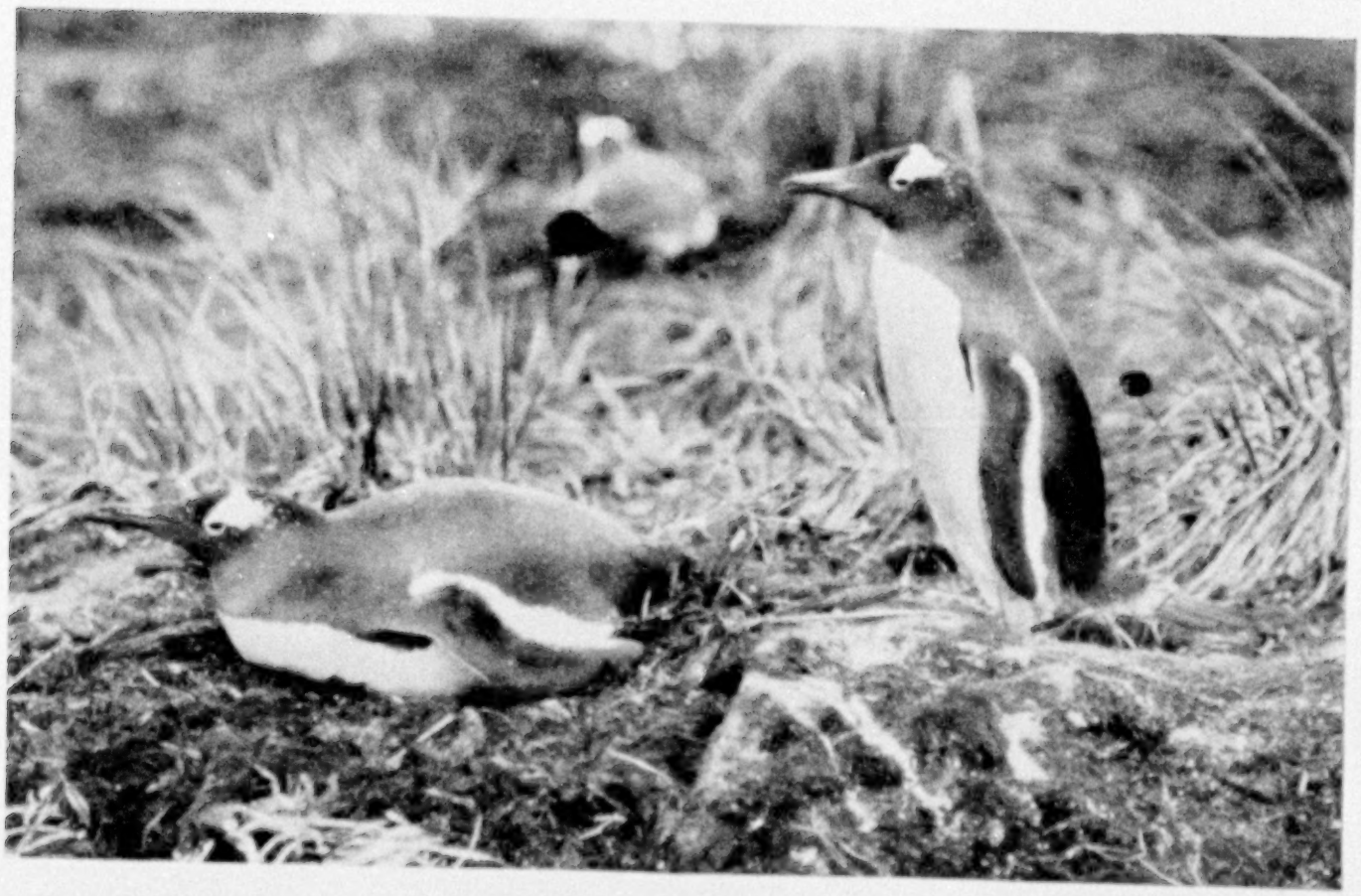
KING PENGUINS "MARCHING THROUGH GEORGIA" (SEE PAGE 441)

These stalwart royal birds stand a yard high. Their plebeian cousins, the Johnny penguins, are short, roly-poly figures, and have many of the attributes of the small boy, including inquisitiveness, good nature, and quarrelsomeness.



INCUBATING KING PENGUINS FIGHTING

The flippers moved so rapidly that the camera failed to stop them sharply. These birds hail and answer each other with long-drawn, martial bugle-calls, and then, as if at a concerted signal, a whole brigade will start marching toward the sea.



A PAIR OF JOHNNY PENGUINS AT THE NEST

Unlike the king penguins, which build no nests but carry the single egg on their feet, the "Johnnies" build bulky nests of stone and debris and lay two nearly spherical eggs.

TAKING TO THE TALL GRASS

The fat little bodies of the Johnny penguins seem to be made to stand hard knocks, for frequently they tumble down while walking over rough ground, and they also suffer fearful batterings when landing through a heavy surf.

A JOHNNY PENGUIN CROUCHING SOLICITOUSLY OVER ONE EGG AND ONE CHICK

The eggs usually hatch several days apart, and one chick is consequently much larger than the other during the whole period of growth. When a brooding penguin is driven from its nest, it lingers near by, trumpeting loudly until the disturber has withdrawn, then it examines the nest minutely, stooping over its treasures like a near-sighted person. When satisfied that all is well, it settles down contentedly again.

the earth forever unless the British Government awakens to its responsibility.

Toward the end of the Antarctic summer—that is, about the last of February—we weighed the *Daisy's* two heavy anchors and tacked in the teeth of an easterly wind along shore out of the Bay of Isles and in through the narrow mouth of Possession Bay, where Captain Cook so many years before had landed and, "under a discharge of small arms," had claimed the snowy isle for his king.

We moored near the head of this comfortless bay before a semicircle of perpendicular glacier walls. The hills shut off every view save to the north, where the distant sea heaved beyond the entrance and long rollers broke on a bar which almost inclosed the inner haven. On the eastern shore a valley, crowded between a pair of pointed, symmetrical mountains, narrowed to a boulder-strewn pass and led to the cliffs above Antarctic Bay.

Little verdure could be seen anywhere from the deck of the ship. A penetrating wind howled and howled down the white-shrouded hills. The pale sunlight seemed to have lost its power to cheer. It was like issuing from a refrigerator when on March 15 we pointed the good brig's prow toward the open sea and began the long voyage home.

Notice of change of address of your GEOGRAPHIC MAGAZINE *should be received in the office of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your June number, the Society should be notified of your new address not later than May first.*

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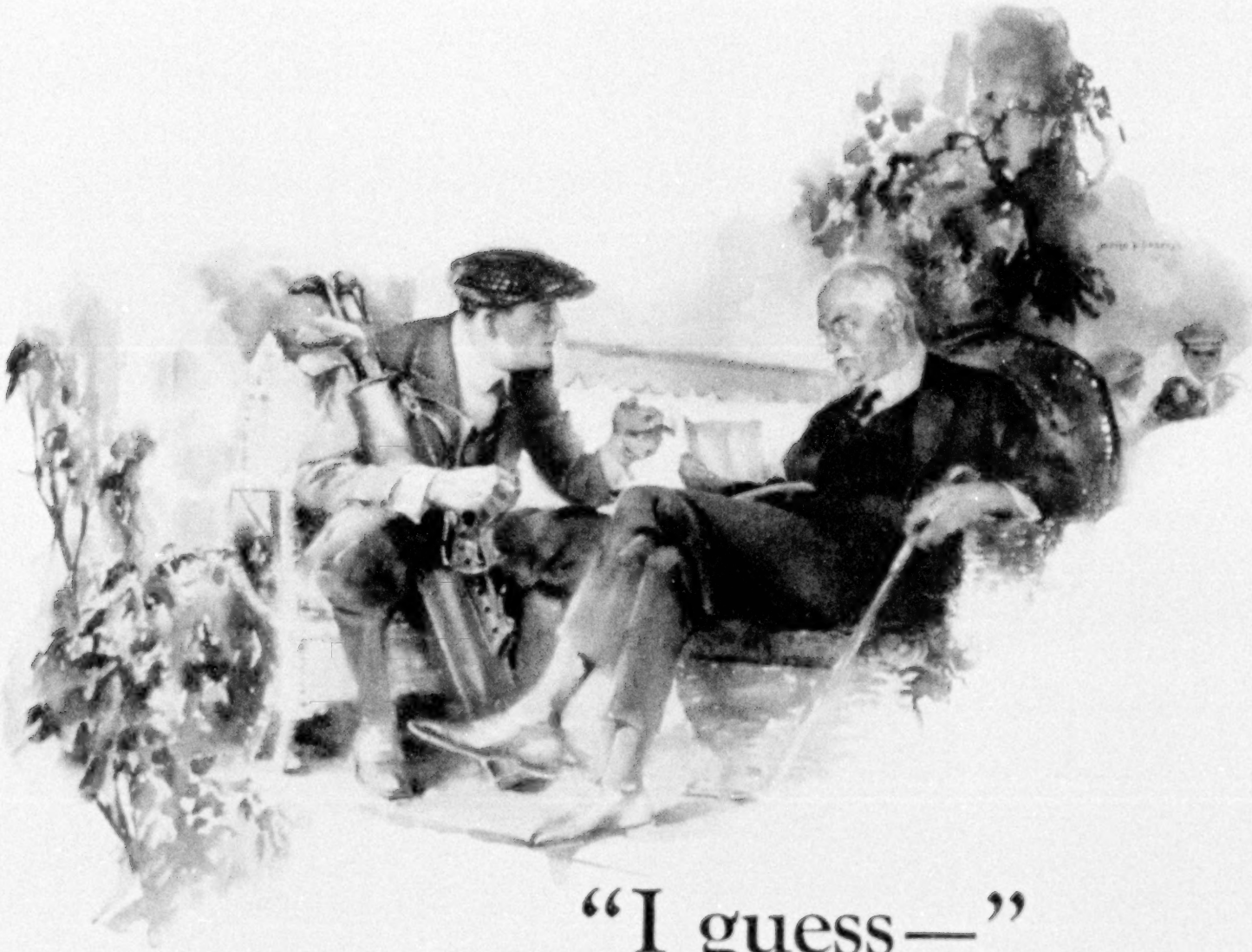

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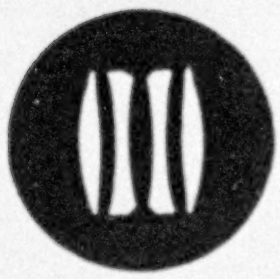

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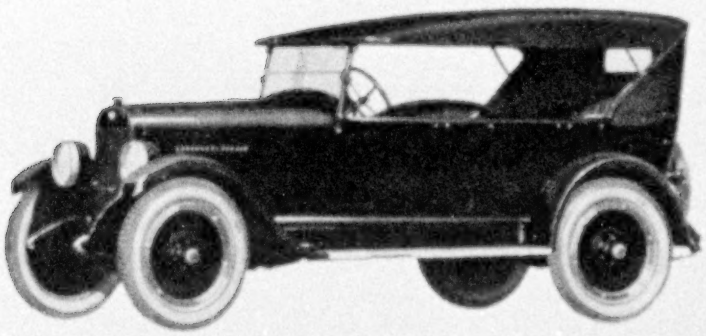

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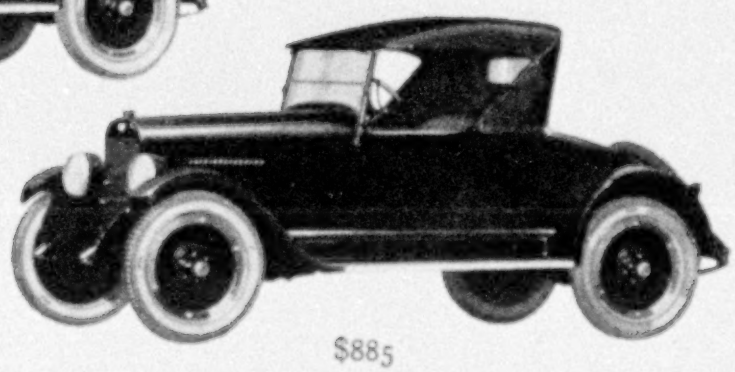

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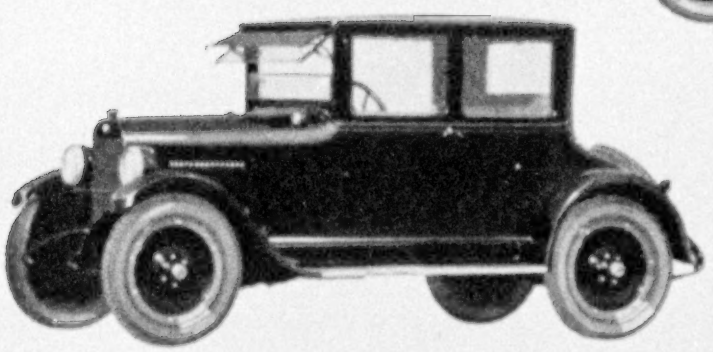

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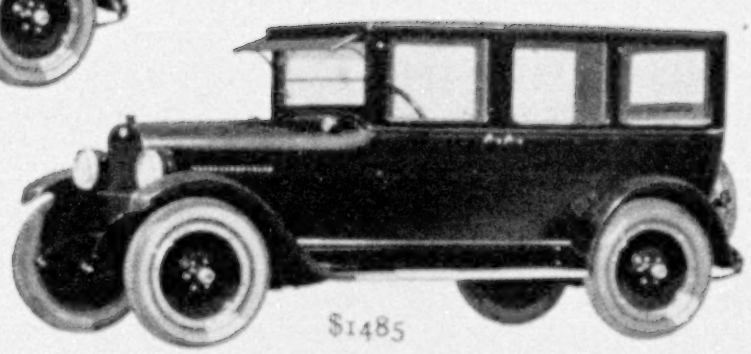

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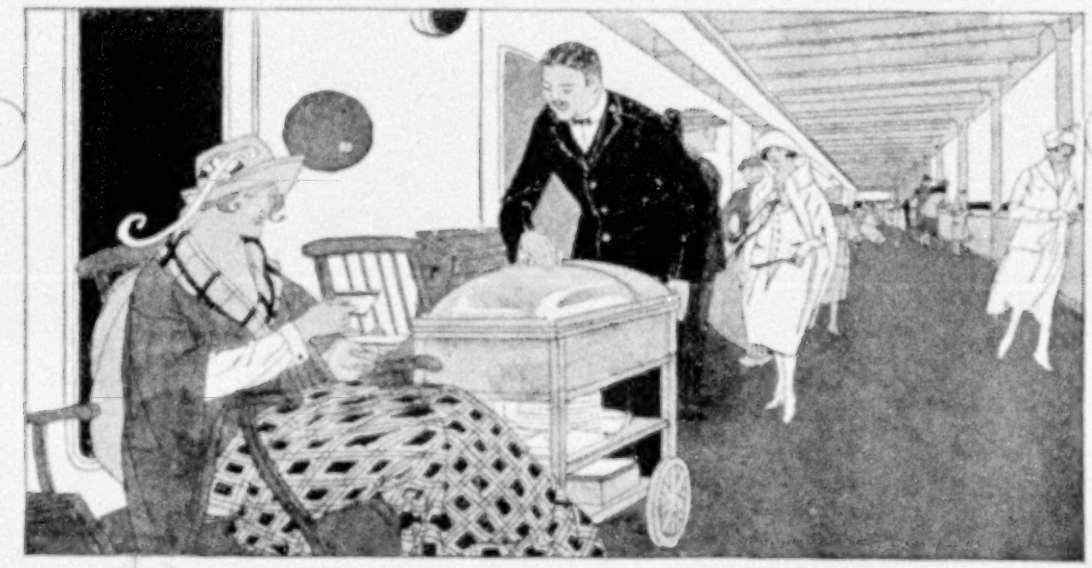

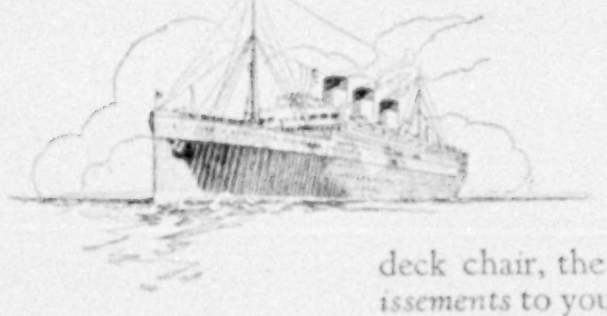

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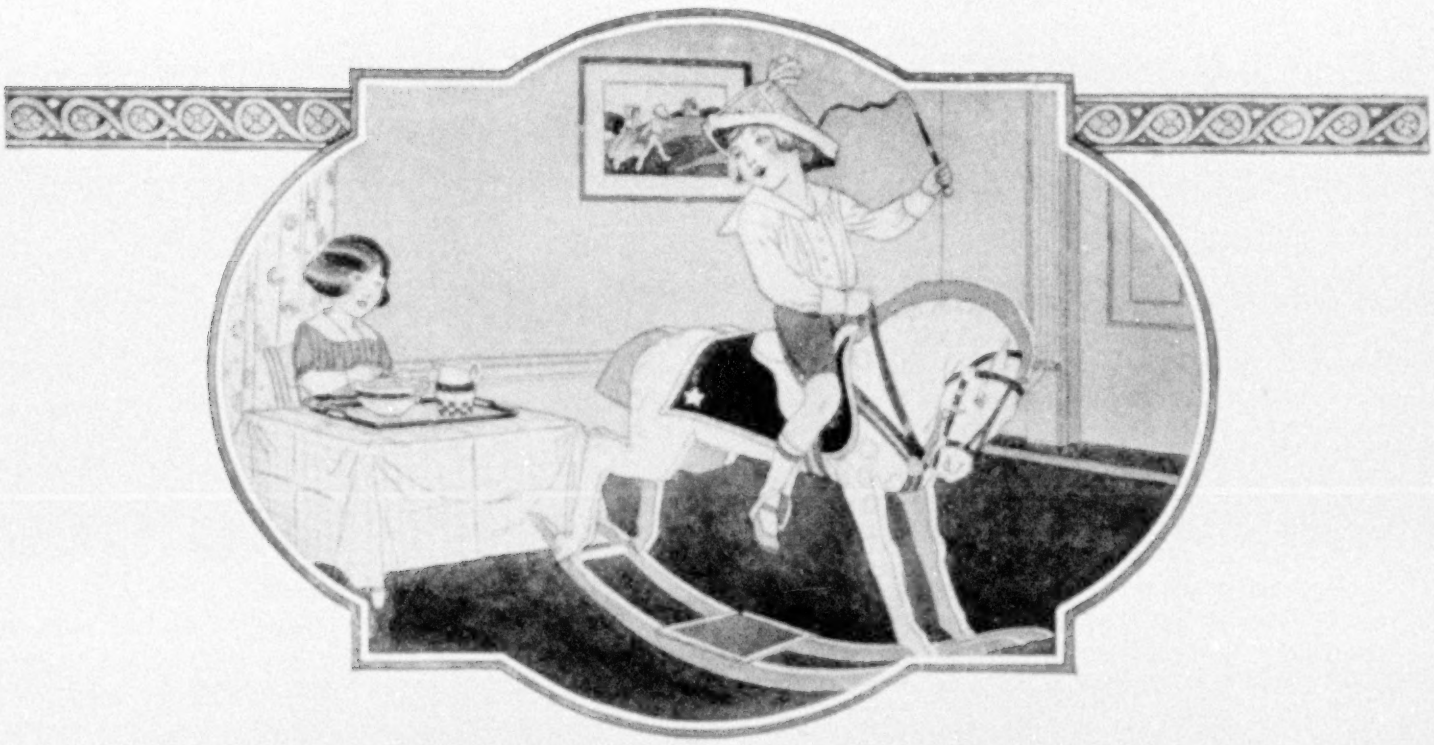

Can't you recall the famous old nursery jingle that goes—

Ride a cock-horse to Banbury-cross
To see what Tommy can buy;
A penny white loaf, a penny white cake,
And a two-penny apple-pie.

ARE there any folks left who don't know that the most delicious food you can get is right around at your own grocer's?

It's the old story of the Bluebird of Happiness. After searching all over the world for "something good" you may find it right in your own home.

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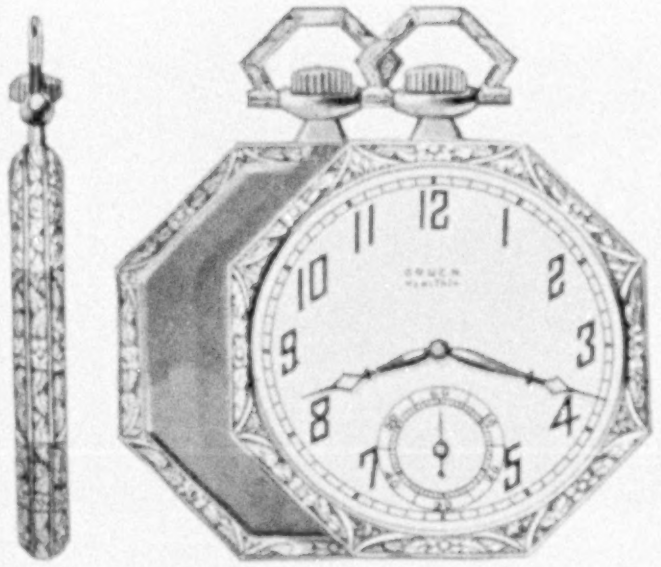

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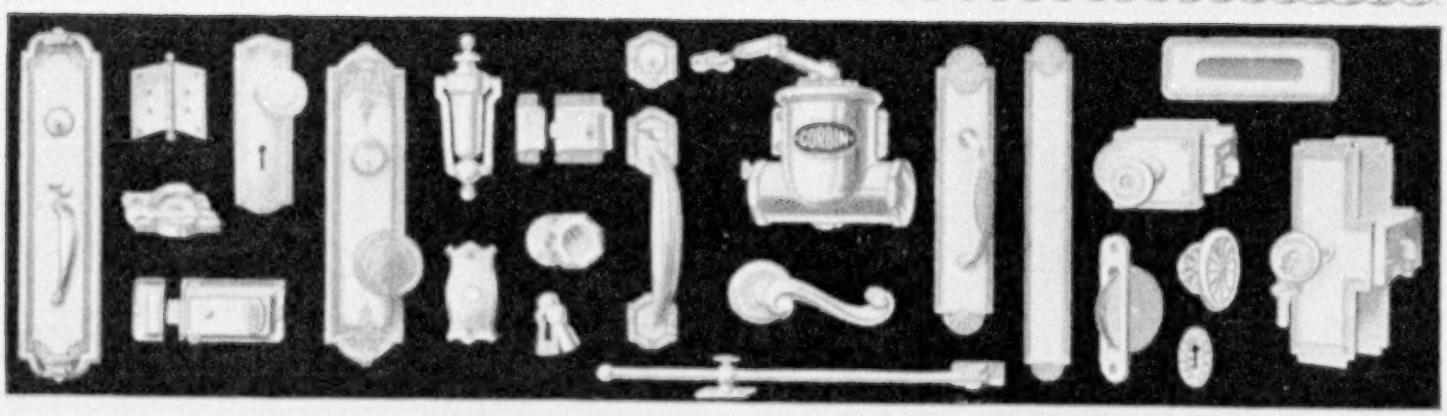

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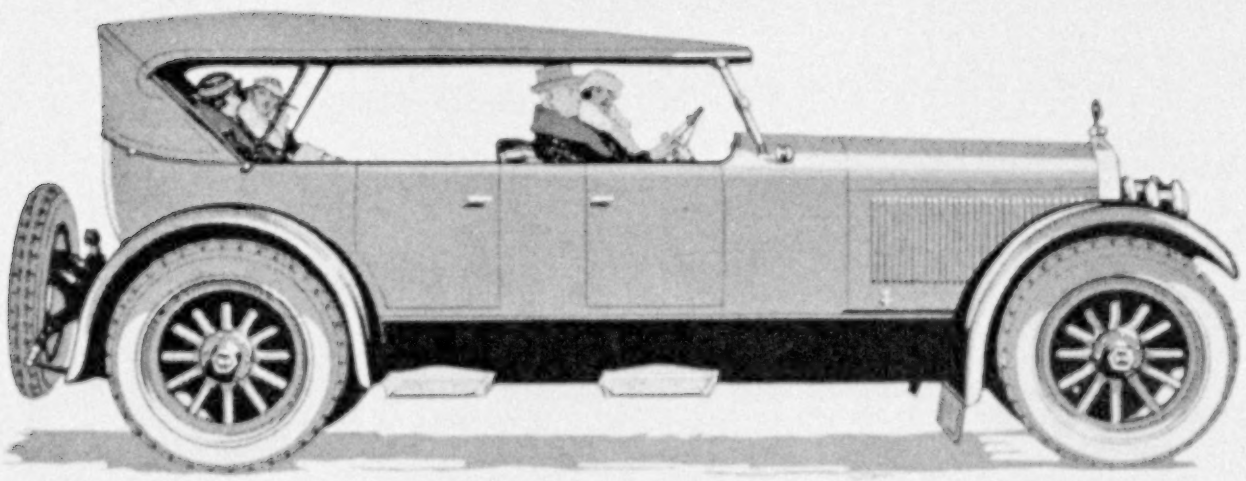

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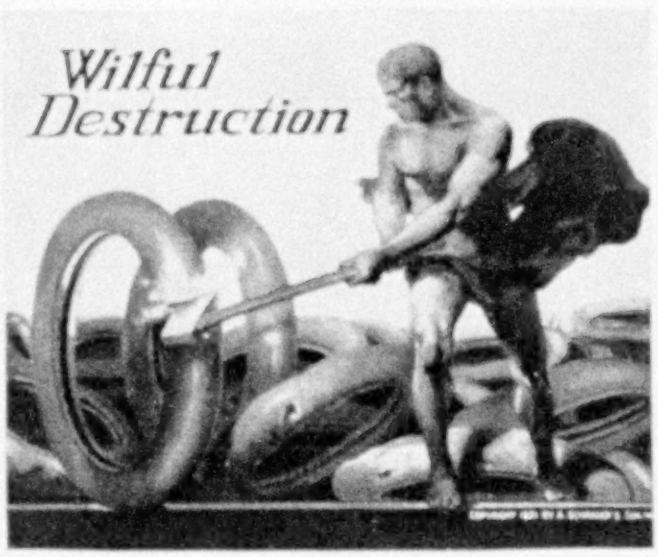

Your tires are being just as wilfully destroyed when you run them without proper air pressure. The axe process may be faster, but under-inflation is just as deadly.

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IDEAL Power Lawn Mowers

My Greatest Summers

all were spent in Southern California

By An Easterner

THAT may seem strange to you. I, too, once thought—before I spent a summer there—that Southern California was a place to go in *winter*, not in summer.

And yet I know no other that offers such a wealth of summer fun, such complete recreation because of *complete change*, or—strange as you may think it—a summer climate so attractive in all ways!

I have spent summer after summer there, and in a three-months' stay, slept under blankets ninety nights.

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You motor, if you wish, for 4,000 miles on paved highways as smooth as city streets through a country unlike anything you've ever seen—unless you've been there.

You play golf on inspiring courses, some of the world's best. You stay at beautiful seashores at the foot of mountain ranges, or in the wilderness at mountain camps.

You view a great desert, like Sahara, and drive back to one of the world's largest cities for your dinner at a famous restaurant or hotel.

You visit great National Parks and Forests—see giant trees, stupendous panoramic views. Or you go quietly and fish in mountain lakes and streams or at world-famous ocean fishing grounds.

You hike, you ride horseback, you breathe deep and you enjoy a sort of youthfulness that you haven't felt, perhaps, for years.

And all within a *few hours* of a great *metropolitan center!*—an easterner who doesn't know hardly can conceive of this.

Different and Enchanting

The enchanting difference is what lures me and the other thousands that go there in the summer from the east.

It's that difference that renews your youth, changing your view point if you're "run down." You become absorbed, fascinated, relaxed to perfection. The greatest cure for "nerves" you've ever known.

Summer? An amazing summerland—you'll never spend a more delightful, restful, interesting summer anywhere.

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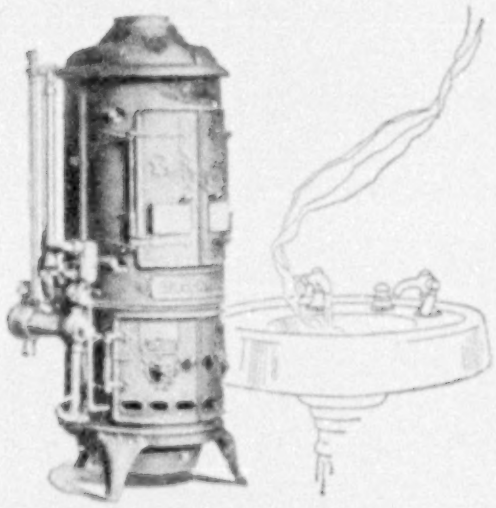

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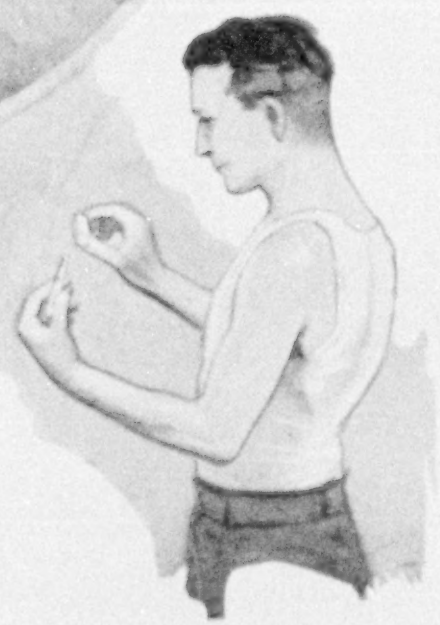

Putting a Colgate "Refill" in the "Handy Grip"

is like putting a new blade in a razor—easy and simple. The soap itself is threaded to screw into the socket. There is no waste.

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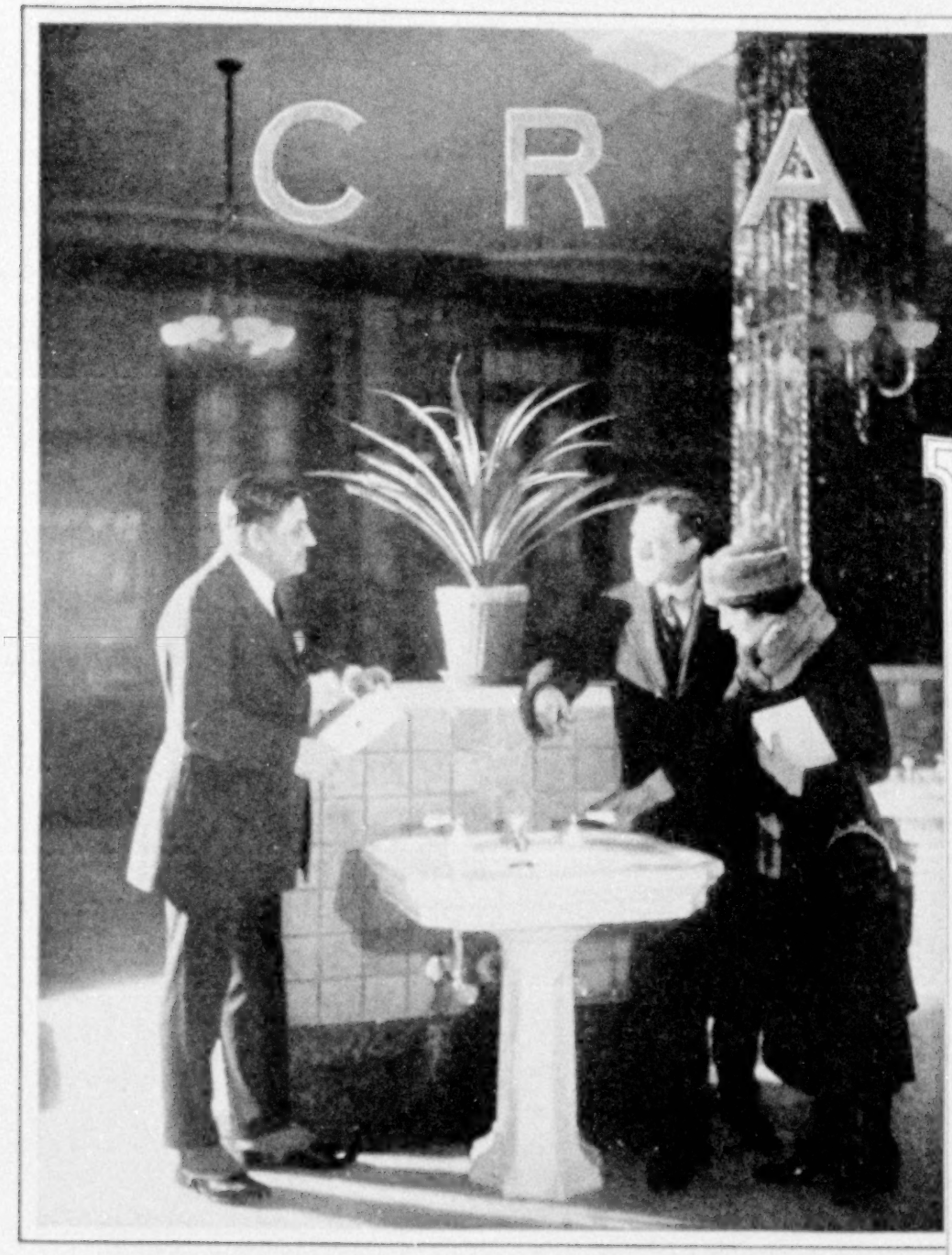

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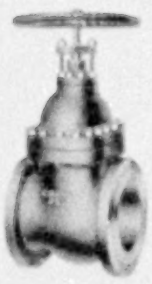

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"SINCE 1893-THE STANDARD"

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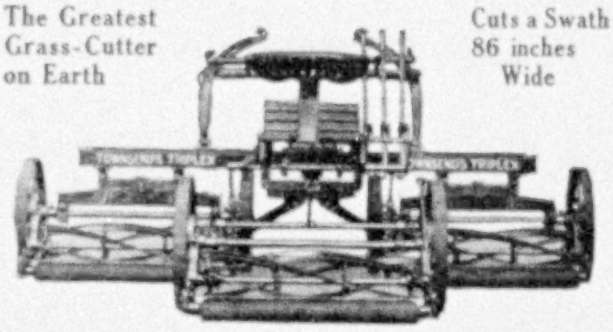
The Greatest Grass-Cutter on Earth

Cuts a Swath 86 inches Wide



Floats Over the Uneven Ground as a Ship Rides the Waves

One mower may be climbing a knoll, the second skimming a level, and the third paring a hollow. Drawn by one horse and operated by one man, the TRIPLEX will mow more lawn in a day than the best motor mower ever made; cut it better and at a fraction of the cost.

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Does not smash the grass to earth and plaster it in the mud in springtime, neither does it crush the life out of the grass between hot rollers and hard, hot ground in summer, as does the motor mower.

The public is warned not to purchase mowers infringing the Townsend Patent, No. 1,209,513, December 19th, 1916.

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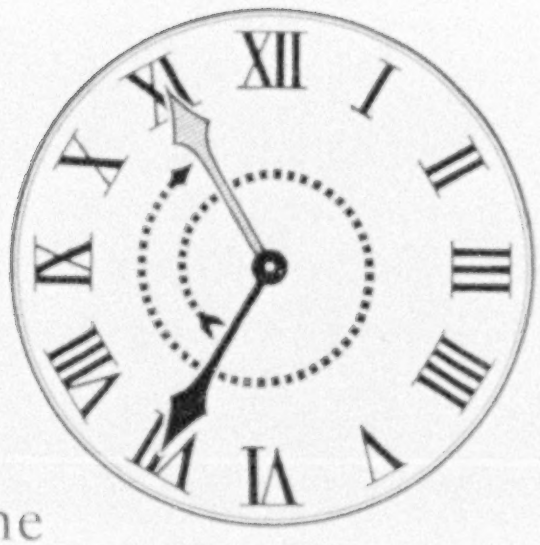

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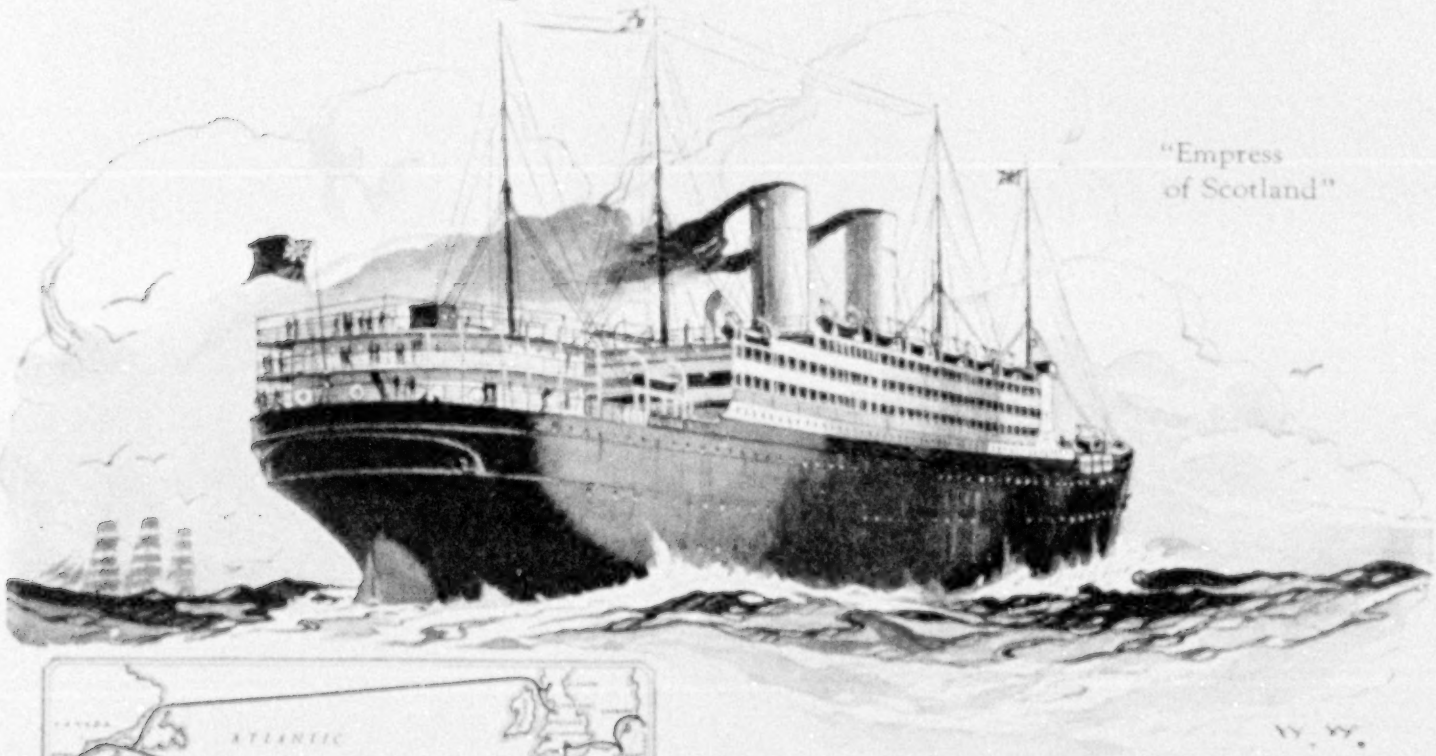

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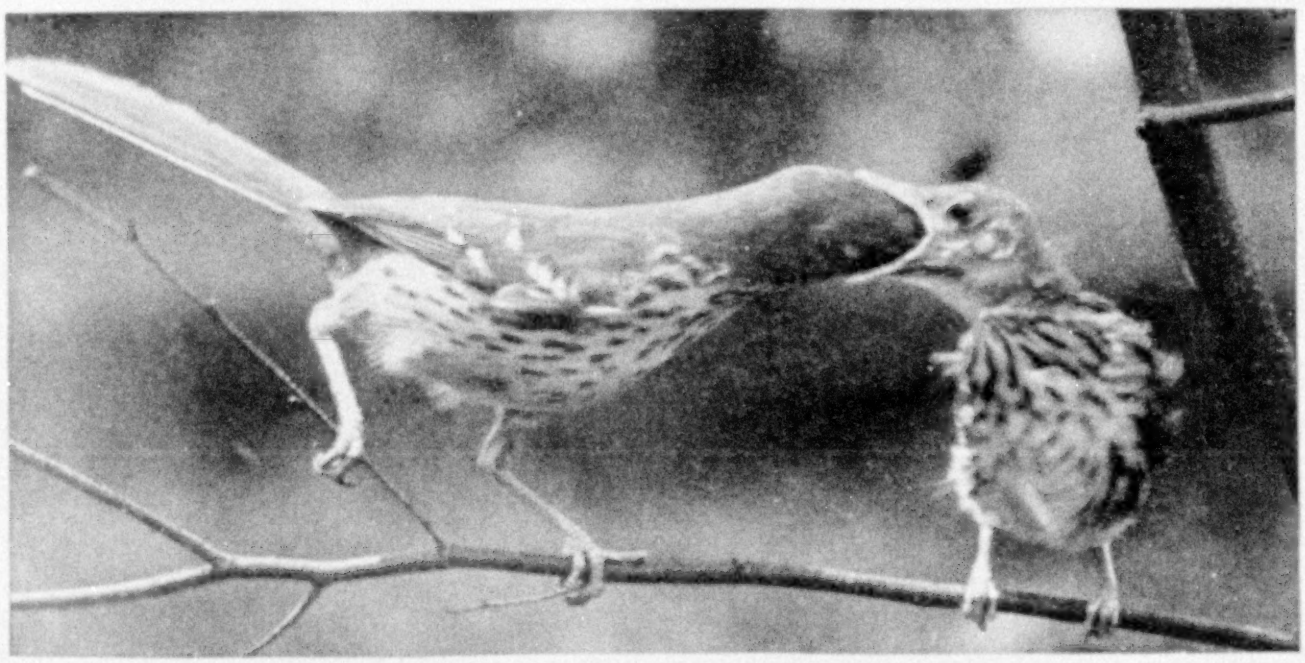

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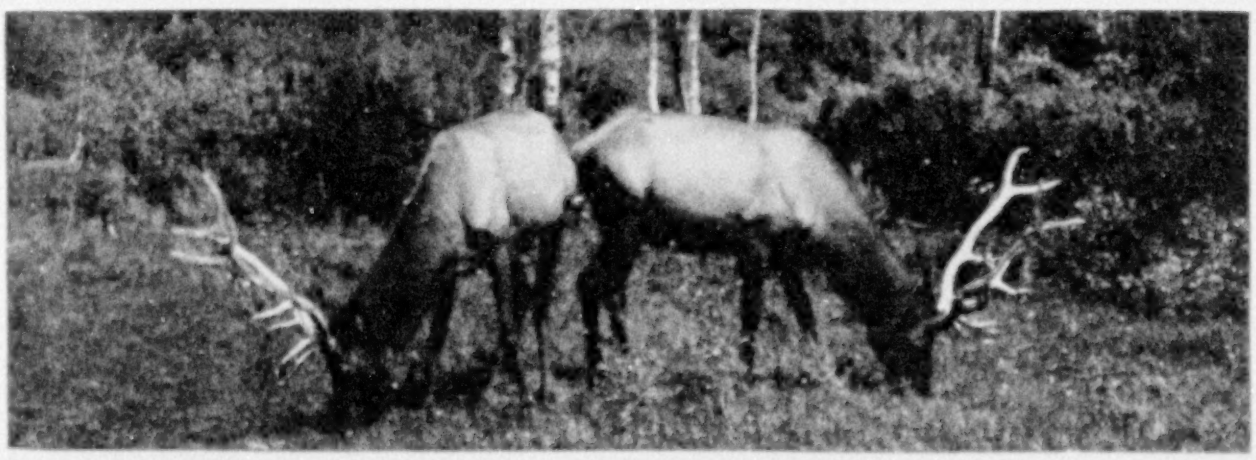

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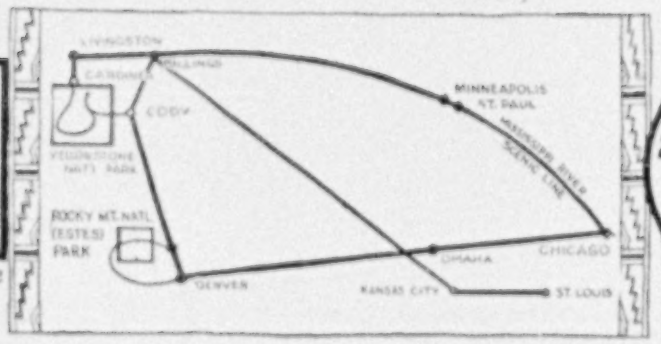

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Seventy-Seventh Annual Statement

DARWIN P. KINGSLEY, President

Balance Sheet, January 1, 1922

Securities at Market Value as furnished by Insurance Dept., State of New York

ASSETS		LIABILITIES	
Real Estate	$8,362,881.00	Policy Reserve	$787,157,463.00
Mortgage Loans	183,722,805.92	Other Policy Liabilities	28,527,025.08
Policy Loans	164,305,141.17	Premiums, Interest and Rentals prepaid	4,361,995.18
Collateral Loans	2,301,000.00	Taxes, Salaries, Rentals, Accounts, etc	7,549,037.63
Liberty Bonds and Victory Notes	120,628,900.00	Additional Reserves	7,485,874.00
Government, State, Province, County and Municipal Bonds	155,439,933.50	Dividends payable in 1922	42,287,368.71
Railroad Bonds	271,524,487.07	Reserve for Deferred Dividends	59,303,179.00
Miscellaneous Bonds and Stocks	7,325,003.00	Reserves, special or surplus funds not included above	15,960,196.20
Cash	11,067,144.16		
Uncollected and Deferred Premiums	14,674,443.08		
Interest, and Rents due and accrued, etc	13,280,399.90		
Total	**$952,632,138.80**	**Total**	**$952,632,138.80**

Paid to and on Account of Policy-holders during 1921	**$124,308,409.00**
Loaned Policy-holders during 1921 under Policy Contracts	**40,871,382.00**
Loaned on Farms during 1921	**15,004,330.00**
Loaned on Mortgages for housing purposes during 1921	**9,646,991.00**
Loaned on Business Property during 1921	**11,358,909.00**

The earning power of Ledger Assets, including Cash in Bank, advanced 0.16% during the year

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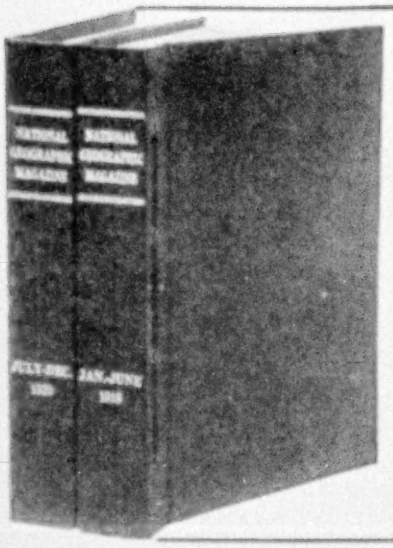

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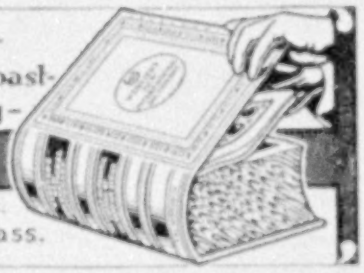

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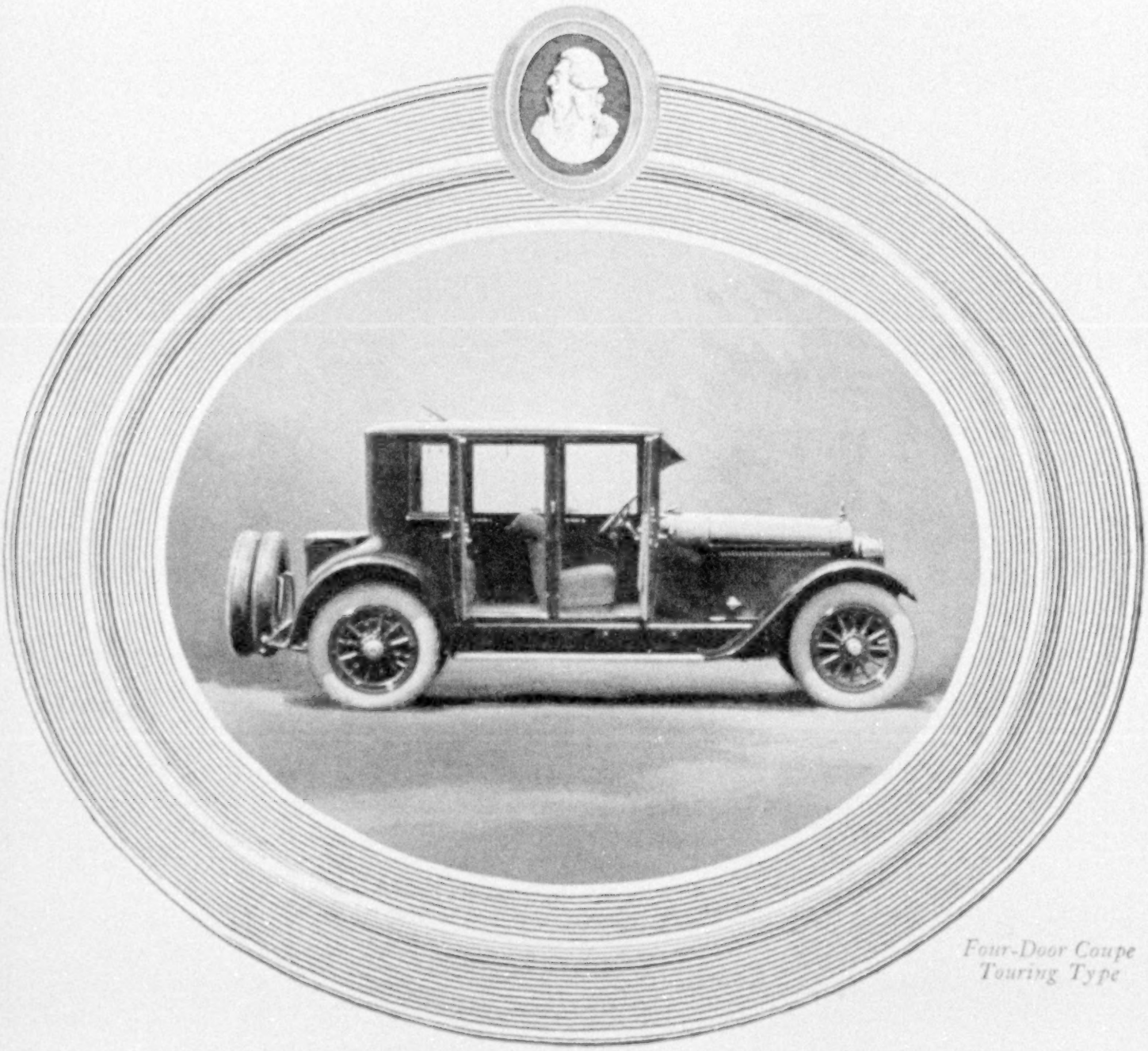

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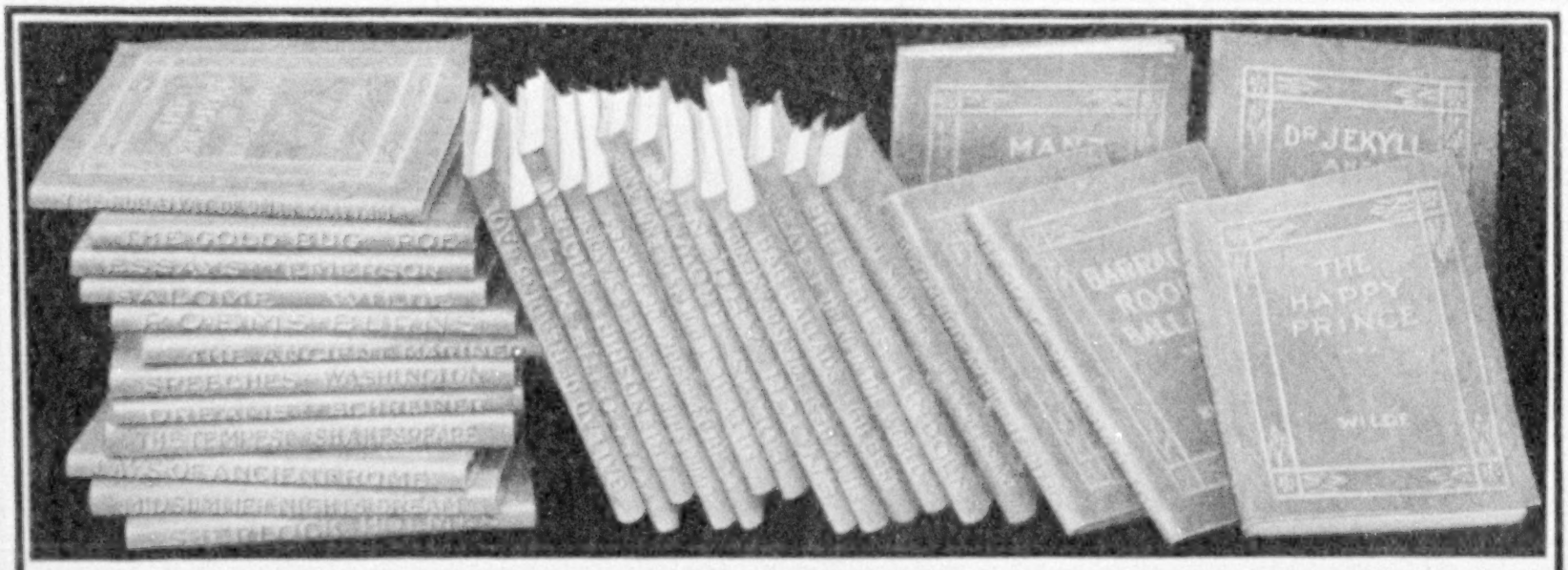

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